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AMERICAN

# JOURNAL OF SURGERY

*A Magazine of Practical Surgery in All its Branches*

WALTER M. BRICKNER, M. D. Editor-in-Chief
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PUBLISHED MONTHLY BY SURGERY PUBLISHING CO., 92 WILLIAM STREET, NEW YORK, U. S. A.
J. MacDonald, Jr., M.D., President.

Entered at New York as second-class matter.
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VOL. XXIX. AUGUST, 1915. No. 8.

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VOL. XXIX. AUGUST, 1915. No. 8

# SHOCKLESS OPERATIONS.

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COLUMBUS, OHIO.

The clinical picture of shock, following injury or operation, is familiar to every experienced physician. Various theories have been advanced to explain the phenomena connected with this condition, but none of them has been accepted as entirely satisfactory. The latest theory is that of Crile, based upon certain findings in his private laboratory. Unfortunately, however, these findings have not been corroborated by workers in other laboratories, whose reports, on the contrary, so far as published, have been antagonistic to his theory.

While it is universally conceded that excessive hemorrhage is the most common cause of shock, it must be admitted that certain traumatisms may produce the same cinical symptoms;* but just how these symptoms are produced is a question which has not been answered. If Crile's theory is correct, then more or less shock should be found in all extensive operations in which no precautions are taken to block by injections the nerves connecting the field of operation with the brain centers. If shock frequently appeared when no injections were used, and did not appear when they were used, the problem would be greatly simplified.

The promptness and unanimity with which operators who have adopted anoci-association attribute absence of shock in their operations to the use of the injections, would be purely amusing did it not present such a pitiful illustration of illogical thinking. Crile's theory is beautifully simple, and, presented in his captivating way, it naturally leads superficial thinkers astray, so that their reasoning assumes the *post hoc ergo propter hoc* circle, while a more logical mind might regard it all as purely a *non sequitur*.

A rude operator, who accomplishes his end largely by mere brute force, who is indifferent as to hemorrhage, and careless as to protection of his field of operation, will doubtless meet with much shock; and if he later learns gentler methods, is more cautious as to hemostasis, and more careful in protecting the operative field, he will find the shock disappear, and if in the meantime he has been induced to use the so-called "anoci-association" he may be deluded into attributing all his improvement to the latter while ignoring the former essentials. Crile is a fine anatomist, an accomplished surgeon, and a skillful operator, and I suspect that in his modesty he has mistaken the results of his own skill for the results of his "anoci-association."

While fear and anxiety on the part of the patient are undesirable, it is very doubtful if those conditions alone will produce shock. At least out of an experience of nearly ten thousand abdominal operations I have never met with a single instance, although I have operated on patients who were almost frantic from fear, with a resulting high pulse rate, and even an elevation of temperature which could be explained by nothing in the physical condition; yet after the operation (an hysterectomy perhaps) temperature and pulse have at once dropped to normal, and the patients have made an absolutely smooth convalescence. Nevertheless, the experienced surgeon will naturally possess a hopeful mental attitude, and will impart more or less of his own optimism to his patient. In that way he will change her attitude of fear to one of hope and courage. In these cases the administration of scopolamin-morphin, an hour before the giving of the anesthetic, is very helpful, and many patients, although really awake when the anesthetic is commenced, have no recollection of it, and when coming out from the anesthesia a number of hours later can hardly be convinced that an operation has been performed.

After discussing this matter with a colleague in December, I decided to take particular notice of my own operative cases for the next month or two, and see what, if any, shock occurred from operations *per se*. In my regular routine work during sixty days (January 1-March 1) I performed 120 major operations. During this time I did many minor operations, but in none of the operations, whether major or minor, did there appear any sug-

*"The most common cause of so-called surgical shock is collapse from loss of blood, and traumatism of important structures in hasty attempts to control hemorrhage."—W. J. Mayo, "Journ. A. M. A.," March 20, 1915.

gestion of that combination of symptoms which we call shock.

The anesthetic used in all the cases was the drop-ether, preceded (except in children) by a hypodermatic injection of 1/6 grain morphin and 1/100 grain scopolamin. This is a combination I have used for many years, and in thousands of cases, and with only the most gratifying results.

My patients are all private patients, and during convalescence are looked after daily by myself. They are seen during the few days following operation not less than twice a day, oftener if necessary, and then once a day during the later convalescence.

Operations are performed as rapidly as is consistent with thoroughness, and the patients usually sleep quietly for an hour or more after returning to their rooms. Post-operative nausea occurs in some cases, but in others there is no complaint whatever. The same is true of gas pains, though fewer escape the latter than escape the nausea. Care is taken, in closing the incisions, that the parts are brought into apposition, but not so tightly as to interfere with either the nerves or blood-vessels in the line of suture Too great tension is, I think, responsible for much local post-operative pain. As a result, in a number of cases patients who have had abdominal operations performed without their knowledge have suspected nothing of it until the first dressing at the end of the week. Patients usually greet me on the morning after operation with a pleasant smile, and except that they may have had some stomach disturbance express themselves as feeling quite well; are, indeed, generally pleasantly disappointed by the absence of disagreeable sensations.

That the injection of urea and quinine into the field of operation so obtunds sensibility as to relieve some of the post-operative pain about the wound is undoubtedly true; but if care is taken in adjusting and closing the wound, bringing the parts into snug but not too tight apposition, patients will have little cause for complaint. It is notorious that post-operative wound infection is much more common in cases in which the quinine and urea have been used than in those in which the usual closure is made, and many surgeons who have used this combination for purposes of local anesthesia have complained of infection and even sloughing of the edges of the incision. Whether the increased liability to infection is due to the drugs themselves, or to trophic changes due to interference with innervation, has probably never been positively determined; but the fact remains, and most patients would prefer to have the slight increase of his comfort from the non-use of the quinine and urea than to suffer from the greater and more prolonged disturbance connected with the post-operative infection.

At the present time we are hearing very much about "twilight sleep" in connection with obstetrical practice, and those who use it claim that, owing to the absence of pain and anxiety, the patients are remarkably free from the depressing effects of the confinement, and are ready to be up and around, if permitted, within forty-eight or even within twenty-four hours. If the theory of brain-cell exhaustion from unfelt pain is correct, these patients should all show more or less signs of shock, but the advocates of the method claim that the reverse is true.

A number of years ago a head nurse, who came to the Grant Hospital from an institution in the East, repeatedly expressed her surprise at the absence of shock which she found in our operative cases. In talking with her I found that the surgeons she had previously served had been in the habit of taking an hour or two to make a twenty-minute operation; they had been rather indifferent to hemorrhage and to protecting the field of operation, and they had not employed the delicacy of touch in intra-abdominal work which due respect for that field of operation demands; hence the presence of shock there and its absence here.

There is undoubtedly a large number of surgeons in the country who could from their records more than duplicate my report of shockless cases. I have talked with many such surgeons, and they tell me that they do not have shock in their work, except under conditions which have been previously mentioned. Shockless operations are the rule, the others the rare exception.

Within the last few weeks I have known of two deaths from shock, one from an exploratory incision with considerable manipulation of the parts, the other from an abdominal hysterectomy for fibroid. In both the operator, who is a firm believer in anoci-association, had used his local injections and had administered nitrous oxide-oxygen instead of ether. The contrast was painful, but the pain was not mine.

In my abdominal operations the appendix is practically always removed as a routine procedure, even if it presents no gross evidence of disease. In the appended report the appendix was so removed, though it does not appear in the printed record.

I am a firm believer in the importance of decayed teeth in the production of many constitutional disturbances, and consequently in all cases my anesthetist at the completion of the operation examines

the teeth, and if old roots or rotten teeth are discovered which are past saving by the dentist, they are at once extracted; and many a patient has really shown more gratitude for the removal of these old teeth than for the removal of the pathology for which the operation was undertaken.

In operating for uterine cancer, unless there are positive contraindications, I perform the usual radical Wertheim operation, with preliminary ligation of both internal iliacs as recommended by Cobb. The ligation of these vessels renders the operation almost bloodless, and this hemostasis obviates shock.

In operating for cancer of the breast, the usual "dinner-plate" operation of Rodman is ordinarily pursued, with a thorough dissection of the axilla, but saving enough of the pectoralis major to protect the axillary vessels, as recommended by Murphy. In many of these cases it is necessary to make transverse incisions, with undermining of the opposite breast, so as to bring it over to cover the raw surface.

In cases of gangrenous appendicitis, temporary drainage is usually advisable. This is done by making a stab incision in close proximity to the anterior-superior spine, and passing from within out a cigarette drain, together with the catgut ligatures which have been used and have been left long. By a little traction on these ligatures the cecum can usually be so adjusted as to lie in contact with the wick, so that there will be no post-operative ileus from adhesions involving the small bowel. The main incision is closed thoroughly so as to obviate, if possible, post-operative hernia.

The case of macroglossia (No. 31) is reported as a major operation, because of the special feebleness of the infant, which, owing to the large size of the tongue and its protrusion, had become so weakened by lack of food as to render amputation of the tongue particularly hazardous.

The hip-joint amputation (No. 87) was in a slender and anemic woman, whose leg was nearly as large as her body. I have performed in all about ten hip-joint amputations, using the Wyeth method, without shock and without mortality.

*Deaths.*—The deaths reported are all that took place following these operations, and no patients were hurried out of the hospital to improve the statistics. Statistics are entirely unreliable unless we know just how they are obtained. Some well-known surgeons exclude from their reports a considerable number of cases who have died after operations, but in which death was not due to the operation itself. Such methods of securing statistics are very unreliable, since the personal equation is so uncertain, and the results may be quite fantastic.

Number 24. This patient was first operated upon under Number 23. She was then found to have uterine hyperplasia, with a mass of pelvic adhesions, requiring a supravaginal pan-hysterectomy. In addition she was suffering from pronounced intestinal obstruction which was found due to seven strictures of the small bowel, these strictures having resulted from tuberculous ulcerations. At the first operation the three tightest strictures were cared for by an intestinal anastomosis above and below the strictures. The condition of the patient was then such as to render it unsafe to treat the four remaining strictures, which were not quite so tight. She made an excellent recovery, and three weeks later the other four strictures were relieved by lateral anastomoses. She went through this operation nicely, but at one point, because of the condition of the intestinal wall, a cigarette drain was inserted. Here, as feared, an intestinal fistula formed, which after discharging freely for a few days closed down, until at the time of her death some weeks later there was little discharge. She died of exhaustion from tuberculosis some three weeks after the second operation.

Number 58. This patient had had serious stomach trouble for ten years, worse of late, with a strong suspicion of malignancy implanted on gastric ulcer. The ulcer was found in the posterior wall of the pylorus, with much exudate, thoroughly organized. A pylorectomy was done in the usual way, but with great difficulty on account of the extensive adhesions and exudate. The man did well after the operation for forty-eight hours, then became suddenly restless, with poor pulse, air-hunger, absence of second heart sound, and the usual symptoms of heart clot. He died in a few hours.

Number 74. This patient was in desperate condition at the time of the operation, which was for the removal of an ovarian tumor with twisted pedicle, which was found to be papillomatous, with extensive metastases involving the upper abdomen. She went through the operation very satisfactorily, and for several days bid fair to make an excellent operative recovery, but died suddenly on the fifth day. Immediate cause of death not found at necropsy.

Number 83. This was a case of chronic metritis with extensive adhesions. While apparently convalescing well, she died suddenly on the seventh day, probably from pulmonary embolism.

Number 100. This patient was operated upon for umbilical hernia and gall-stones. She was very

| No. | Initials. | Sex. | Age. | Operations. |
|---|---|---|---|---|
| 1. | E.G.A. | M. | 36. | Pylorectomy. |
| 2. | C.L.A. | F. | 38. | Appendectomy (gangrenous-drainage). |
| 3. | A.L.A. | F. | 44. | Supravaginal pan-hysterectomy. |
| 4. | C.F.A. | F. | 45. | Supravaginal pan-hysterectomy. |
| 5. | H.A.B. | M. | 35. | Resected cecum; lateral anastomosis. |
| 6. | S.B. | M. | 12. | Estlander operation. |
| 7. | E.B. | F. | 36. | Cholecystectomy. |
| 8. | J.W.B. | F. | 41. | Appendectomy. |
| 9. | E.B. | F. | 43. | Supravaginal pan-hysterectomy. |
| 10. | R.B. | M. | 25. | Appendectomy. |
| 11. | C.C. | M. | 64. | Cancer of neck. Extensive dissection. |
| 12. | C.C. | F. | 45. | Cancer of breast and axilla: double ovariotomy: double salpingectomy. |
| 13. | R.V.C. | F. | 50. | Radical hysterectomy for cancer. |
| 14. | K.C. | F. | 27. | Abdominal pan-hysterectomy (saved ovaries). |
| 15. | A.DeY. | F. | 40. | Supravaginal pan-hysterectomy. |
| 16. | F.H.D. | F. | 28. | Appendectomy. |
| 17. | W.A.D. | F. | 27. | Abdominal pan-hysterectomy (saved ovaries). |
| 18. | H.D. | F. | 20. | Appendectomy: shortened round ligaments. |
| 19. | C.E. | F. | 21. | Appendectomy (gangrenous-drainage). |
| 20. | H.E.F. | F. | 40. | Amputated cervix: perineorrhaphy; doub. salp.; short. r. ligs.; cholecystectomy. |
| 21. | Z.F. | F. | 64. | Wertheim operation for procidentia. |
| 22. | E.H.G. | M. | 23. | Appendectomy. |
| 23. | H.W.G. | F. | 39. | Supravag. pan-hyst.; doub. intest. anastomosis for tuberculous strictures. |
| 24. | H.W.G. | F. | 39. | Four intestinal anastomoses for tuberculous strictures. |
| 25. | O.O.G. | F. | 44. | Abdominal pan-hysterectomy; posterior colporrhaphy; perineorrhaphy. |
| 26. | C.G. | F. | 58. | Cancer of breast and axilla. |
| 27. | E.G. | M. | 29. | "General purulent peritonitis" (appendiceal). Fowler position, etc. |
| 28. | M.G. | F. | 19. | Appendectomy. |
| 29. | R.N.G. | F. | 45. | Supravaginal pan-hysterectomy. |
| 30. | R.L.H. | M. | 24. | Double inguinal hernia. |
| 31. | C.C.H. | M. | 2. | Macroglossia: resection of tongue. |
| 32. | V.H. | F. | 18. | Appendectomy. |
| 33. | F.H. | F. | 33. | Abdominal pan-hysterectomy (saved one ovary). |
| 34. | W.H. | F. | 36. | Exploratory incision. Inop. cancer of mesentery. Double salpingectomy. |
| 35. | L.H.H. | F. | 28. | Amp. cervix; post. colporrhaphy; perineorrhaphy; d. salp.; short. r. ut. sac. ligs. |
| 36. | D.H. | F. | 34. | Supravag. pan-hyst. (saved one ovary). |
| 37. | E.J.H. | F. | 30. | Supravaginal pan-hysterectomy (saved both ovaries). |
| 38. | I.H. | F. | 21. | Appendectomy. |
| 39. | C.H. | F. | 37. | Abdominal pan-hysterectomy. |
| 40. | L.L.H. | F. | 66. | Wertheim operation for procidentia. |
| 41. | E.R.J. | F. | 53. | Abdominal pan-hysterectomy. Cholecystectomy. |
| 42. | M.E.K. | F. | 36. | Supravaginal pan-hysterectomy (saved one ovary). |
| 43. | S.W.K. | M. | 37. | Inguinal hernia; resected omentum. |
| 44. | C.K. | M. | 21. | Appendectomy. |
| 45. | W.S.K. | M. | 49. | Appendectomy (gangrenous-drainage). |
| 46. | J.W.K. | F. | 32. | Abdominal pan-hysterectomy. (Puerperal-abdominal and vaginal drainage.) |
| 47. | E.S.K. | M. | 58. | Cholecystectomy. Appendectomy. |
| 48. | J.G.K. | F. | 60. | Wertheim operation for procidentia. |
| 49. | F.P.L. | F. | 45. | Ovariotomy and salpingectomy. |
| 50. | W.R.L. | F. | 34. | Amp. cervix; post. colpor.; perineorrhaphy; doub. salping.; short. ligaments. |
| 51. | G.M.L. | F. | 51. | Supravaginal pan-hysterectomy. Cholecystectomy. |
| 52. | F.L. | F. | 16. | Tuberculous peritonitis. |
| 53. | J.F.L. | F. | 78. | Large ovarian cyst. Shortened ligaments. |
| 54. | J.L. | F. | 59. | Radical pan-hysterectomy for cancer. |
| 55. | H.M. | F. | 41. | Double ovarian papillomas. |
| 56. | C.F.M. | F. | 42. | Cancer of breast and axilla. |
| 57. | J.S.M. | M. | 23. | Appendectomy (gangrenous-drainage). |
| 58. | C.H.M. | M. | 42. | Pylorectomy. Gastro-enterostomy. |
| 59. | J.C.M. | F. | 33. | Abdominal pan-hyst. (saved ovaries). Perineorrhaphy. Amputated breast. |
| 60. | J.M. | F. | 30. | Abdominal pan-hysterectomy. Posterior colporrhaphy. Perineorrhaphy. |
| 61. | H.R.M. | F. | 35. | Abdominal pan-hysterectomy. Posterior colporrhaphy. Perineorrhaphy. |
| 62. | C.M. | F. | 25. | Cesarean section. |
| 63. | C.E.M. | M. | 34. | Appendectomy. |
| 64. | A.M. | F. | 49. | Ovariotomy (large tumor). |
| 65. | C.V.M. | F. | 51. | Supra-vaginal pan-hysterectomy. Cholecystectomy. |
| 66. | E.S.M. | F. | 24. | Shortened round ligaments; elevated utero-vesical fold. |
| 67. | J.M.M. | F. | 58. | Ovarian dermoid. |
| 68. | L.M. | M. | 16. | Right inguinal hernia; appendectomy. |
| 69. | A.M. | M. | 22. | Appendectomy. |
| 70. | M.M. | F. | 41. | Sarcoma of breast. |
| 71. | J.R.M. | F. | 55. | Radical hysterectomy for cancer. |
| 72. | I.M. | F. | 46. | Double ovariotomy; double salpingectomy; shortened ligaments. Cholecystectomy. |
| 73. | W.M.M. | M. | 29. | Inguinal hernia. |
| 74. | M.N. | F. | 53. | Ovarian papilloma with metastases. |
| 75. | F.P. | F. | 27. | Myomectomy. Shortened ligaments. |
| 76. | S.P. | F. | 40. | Double tubo-ovarian abscesses (drainage). |
| 77. | E.P. | F. | 29. | Amputated cervix; ovariotomy; shortened ligaments. |
| 78. | L.P. | F. | 43. | Abdominal pan-hysterectomy. |
| 79. | H.P. | F. | 14. | Appendectomy. |
| 80. | J.R.P. | F. | 35. | Amputated cervix; salpingectomy; shortened ligaments. |

| No. | Initials. | Sex. | Age. | Operations. |
|---|---|---|---|---|
| 81. | A.F.P. | F. | 44. | Supra-vaginal pan-hysterectomy. |
| 82. | W.M.P. | F. | 42. | Radical hysterectomy for cancer. |
| 83. | W.R. | F. | 41. | Abdominal pan-hysterectomy. |
| 84. | F.R. | F. | 30. | Double tubo-ovarian abscesses; abdominal-vaginal drainage. |
| 85. | N.R. | F. | 22. | Appendectomy. |
| 86. | H.L.R. | F. | 35. | Supra-vaginal pan-hysterectomy (saved both ovaries). |
| 87. | F.M.R. | F. | 29. | Hip-joint amputation for elephantiasis. |
| 88. | S.G.R. | F. | 29. | Abdominal pan-hysterectomy (saved both ovaries). |
| 89. | G.H.R. | M. | 30. | Inguinal hernia. |
| 90. | R.W.S. | F. | 24. | Abdominal pan-hysterectomy (saved both ovaries). |
| 91. | A.S. | F. | 29. | Shortened uterine ligaments. |
| 92. | Z.S. | F. | 34. | Shortened uterine ligaments. |
| 93. | W.L.S. | F. | 34. | Supra-vaginal pan-hysterectomy (saved one ovary). |
| 94. | S.H.S. | F. | 52. | Gastro-enterostomy. Resected pylorus. Anchored right kidney. |
| 95. | W.H.S. | F. | 46. | Supra-vaginal pan-hysterectomy. |
| 96. | F.D.S. | F. | 53. | Radical hysterectomy for cancer. |
| 97. | M.A.S. | F. | 40. | Abdominal pan-hysterectomy. |
| 98. | C.S. | F. | 23. | Supra-vaginal pan-hysterectomy (saved both ovaries). |
| 99. | R.G.S. | F. | 25. | Shortened uterine ligaments. |
| 100. | W.H.S. | F. | 43. | Cholecystectomy. Umbilical hernia. Lipectomy. |
| 101. | M.S. | F. | 55. | Radical hysterectomy for cancer. |
| 102. | E.T. | F. | 23. | Double pyosalpinx. |
| 103. | A.T. | F. | 60. | Cholecystectomy (cancer of liver). |
| 104. | C.W.T. | M. | 45. | Resection of transverse colon for cancer; lateral anastomosis. |
| 105. | J.M.T. | F. | 28. | Abdominal pan-hysterectomy (saved one ovary). Post. colporrhaphy. Perineorrhaphy. |
| 106. | J.C.T. | F. | 63. | Irreducible inguinal hernia. |
| 107. | M.T. | F. | 26. | Double salpingectomy; shortened ligaments. |
| 108. | E.E.T. | F. | 26. | Resected ovary. |
| 109. | M.V. | F. | 53. | Radical hysterectomy for cancer. |
| 110. | W.W.V. | F. | 50 | Wertheim operation for procidentia. Cholecystectomy. |
| 111. | C.W. | M. | 17. | Appendectomy (gangrenous-drainage). |
| 112. | E.E.W. | F. | 26. | Supra-vaginal pan-hysterectomy (saved one ovary). |
| 113. | L.W. | F. | 27. | Double salpingectomy. Shortened uterine ligaments. |
| 114. | C.W.W. | M. | 33. | Appendectomy. |
| 115. | J.W. | F. | 57. | Cholecystectomy. Nephrectomy (hypernephroma). Myomectomy. |
| 116. | L.W. | M. | 4. | Inguinal hernia. |
| 117. | D.J.W. | F. | 41 | Cancer of breast and axilla. |
| 118. | L.Y. | F. | 28. | Abdominal pan-hysterectomy (saved both ovaries). |
| 119. | M.Y. | F. | 18. | Double salpingectomy; shortened uterine ligaments. (Puerperal infection.) |
| 120. | E.Z. | F. | 22. | Amputation at knee. |

fleshy, weighing about 300 pounds, and in closing the umbilical hernia a lipectomy was done for her relief. She went through the operation easily, but died suddenly, as though from embolism, on the second day.

Number 101. This patient was operated upon for advanced cancer of the uterus, the usual radical operation with ligation of the internal iliacs. She did well for a week, but then commenced failing and died of exhaustion about three weeks after her operation. The disease was found to be more extensive at the time of her operation than had been anticipated, and should have been regarded as inoperable.

Number 103. This was a difficult cholecystectomy for gall-stones, with extensive exudate and a cancerous development involving the deeper structures, and metastasis to the liver. She was greatly relieved by the operation with its drainage of the bile ducts, but died of exhaustion some weeks later.

### CONCLUSIONS.

(1) Crile's laboratory findings, showing exhausted brain cells, on which he bases his theory of shock, have not been confirmed by independent laboratory workers, and such confirmation is clearly very desirable.

(2) Operative shock, from a practical standpoint, is the result of hemorrhage, or of undue and usually necessary traumatism in the field of operation.

(3) Prolonged operations, by the long exposure of the field of operation and the prolonged anesthesia, materially increase the liability to shock, so that a moderate hemorrhage, which would not produce any ill-effects in a short operation, may result in marked shock.

(4) Any surgeon who operates rapidly, who guards against unnecessary hemorrhage, and who avoids brutality in handling tissues, will have shockless operations.

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### LOCAL ANESTHESIA IN INGUINAL HERNIA.

In the case of an ordinary inguinal hernia, having determined the length of the incision, the anesthesia needle is applied about one-half inch above the termination of the incision, and the subcutaneous tissue is then infiltrated the entire length of the proposed incision. The needle is now pushed deeply in, and the abdominal coverings are thoroughly injected with the fluid. The needle is next inserted just below the external ring and then, as it is pushed downward, the tissues around the cord with the ilioinguinal nerve are anesthetized. I believe that by delaying the operation for at least twenty minutes, a much more bloodless field is produced.—CARLISLE P. KNIGHT in the *New York Medical Journal.*

# SOME DANGERS ATTENDING THE UNGUARDED USE OF ETHER: OBSERVATIONS CONCERNING ITS INFLAMMABILITY.

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It has long been known to physician and chemist alike that ether, as well as its vapor, is highly inflammable, and under certain conditions may ignite and cause serious trouble. No one doing surgery, therefore, can afford to be careless about the use of this particular anesthetic in the presence of an open flame. It is necessary quite frequently to operate in a private house, with low ceilings, under the guidance of a gas or lamp light, either of which is sometimes brought near to the patient. Great care should be exercised on such occasions, for while accidents rarely happen, yet, when they do, they are not only fraught with danger, but are keenly embarrassing to the surgeon and his assistants.

Much is being said in medical literature about the comparative safety of the various anesthetics, but, since the advent of the new cauteries, certain unusual dangers have not been sufficiently emphasized. At least I have felt so, especially after an incident which, though resulting favorably to everyone, for a moment caused consternation and havoc. It occurred during the cauterization of an epithelioma of the malar region in a man, who was receiving ether by the drop method from a very careful anesthetist. The instrument was an auto-ether cautery, which had done excellent service many times previously. Suddenly, when the work was almost completed, the ether vapor ignited and instantly spread to every article or substance which held the fumes. The flames completely enveloped the patient's face and mouth, and quickly extended to the mask, which, with the container, had by this time dropped to the floor, where the fire rapidly gained headway on account of the ether, which had spattered in all directions. The exploding vapor was, of course, soon extinguished, but the various fabrics upon which the ether had been deposited burned furiously. Intense excitement prevailed for a moment, but by timely dexterity the flames were extinguished and no harm whatever was done to the patient. Had the accident occurred in the presence of nervous, untrained assistants, the result might have been disastrous. On account of this unexpected event, an extensive investigation was conducted in order to determine the environment under which ether is inflammable, and therefore dangerous. Some of the findings proved to be an actual surprise.

Ether vapor is two and one-half times heavier than air, and does not rise very high above the operator or patient. This fact has much significance, but there are many other features which are not only interesting, but quite valuable to one who would fully understand the character of ether and its behavior under various circumstances. The manner in which the experimental work was conducted may be assumed from a study of the results which follow. Tedious enumeration of detail will be omitted.

A red-hot iron may be plunged into ether without producing any ill-effects, except to produce a penetrating gas which, like formaldehyde, is very irritating to the ocular and nasal mucus membranes. The iron is cooled as it would be if held in water. Ether set free in an open vessel rapidly scents the entire room in which it is exposed. This vapor, easily detected by the sense of smell, is entirely free from any explosive tendency, being greatly rarefied. Ether vapor is indeed very dense and heavy, even invisible, settling rapidly, like mist, upon the nearest surface. This is shown by the fact that a lighted match or candle may be held two inches above the level of ether in an open container for three minutes without ignition. On account of the great weight and density of ether fumes, blowing over a saturated sponge, draughts in a room, or fanning movements, seem to have little effect in displacing the vapor in its condensed form; on the contrary, it is thinned and disseminated. This does not hold true in case of etherization, in which anesthesia is carried over a long period of time, in a small, badly ventilated room. Here the patient's respiration, in an atmosphere continually saturated with ether, would tend to drive the heavy vapor farther and farther away, with less rarefication. Yet, this being true, ether evaporates so very rapidly as to become less and less inflammable, the farther one is removed from the place where it is exposed, unless, of course, enormous quantities are set free. The danger point with ether lies within a rather large area, surrounding the mask. Ether vapor falls until it reaches some object, then follows the surface of that object, whatever it may be—the patient's body, the operating table, the floor—till rarefication takes place.

The most peculiar characteristic disclosed during the entire experimental process was the constant tendency of ether vapor to cling to surfaces. The smoother the material—porcelain, glass, wood—the more readily the vapor follows it. If a sponge, saturated with ether, is gently placed at one end of a table, or on the floor, or in an ordinary sink, and a lighted match held two feet away and close

to the table, the floor or the bottom of the sink, the vapor will quickly ignite and burn over a considerable surface. The light must be held close to the table. Even two inches above will not suffice. This shows how, mist-like, the heavy vapor not only settles but clings tenaciously to the surface as it instantly spreads in all directions. A saturated sponge, dropped to the floor, close to a flame or lighted match, will also take fire and burn over an area two or three feet square. A sponge saturated with ether and held one foot above a flame will ignite promptly. Beyond this distance there is little or no danger unless the ether drips from the sponge, the weight of the vapor and its tendency to settle being offset in this instance by rapid evaporation.

Although ether vapor is heavy, ether itself, if mixed with water, will always rise to the surface until a proportion of 1-400 is reached. The inability of ether and water to form a solution, is also shown by the fact that, after they are well shaken together and poured into an evaporating dish or upon a sponge, the ether will burn as freely as before until exhausted.

A sponge saturated with ether and ignited cannot be easily extinguished by the application of water. The water, on the contrary, will displace the ether in many directions, carrying the flames with it. Likewise, a bowl containing ether, which is burning, may have water added till it overflows, without disturbing the flames. Water, dashed into a vessel in which ether is burning, simply scatters the fire. The same thing happens when one tries to stamp out a blazing sponge or mass of cotton containing ether. Not only is it a difficult task, but the burning ether clings to the shoe, and may set fire to the clothing of the physician or nurse, or be carried from place to place about the room. Water seems to have very little effect upon burning ether, unless the entire fabric is completely submerged. Indeed, if applied carelessly and with force, it may alarmingly increase the conflagration. A burning ether sponge, kicked or flung across the room, will widely distribute the fire in small quantities. A gauze screen is not readily penetrated by ether fumes, so that an open cautery or other flame will not ignite the vapor, even at the short distance of two inches, if a screen intervenes.

Some valuable deductions may be drawn from the result of these experiments. We need to be reminded occasionally that ether is dangerously inflammable. Its characteristics are peculiar. Ether vapor does not rise perceptibly above the level at which it is generated, but descends to the nearest surface, along which it quickly disseminates itself in every direction. If an open flame is introduced anywhere along this surface, within a radius of two feet, an explosion may take place. Vaporized ether is rarefied as it settles, and, in passing through a distance of three or four feet, loses most of its explosive character. On account of the great tendency to rarefication, continuous administration of ether in a given closed space, in which there is an open flame burning, is not dangerous, unless large quantities are used, and the fire or light brought within three feet of the mask. The opposite holds true regarding certain other gases, as illuminating gas, which, continually escaping in a closed room, for a certain length of time, will explode with tremendous destruction, as soon as a lighted candle is brought into its presence. An open flame, gas jet, high frequency spark, or ether cautery should not be permitted within three feet of the mask during etherization of a patient, if the flame or light is on a level with the patient's face, and by no means if a table or other unobstructed surface intervenes between the flame and the mask.

In this connection let me refer with caution to those operating rooms in which, for want of space, there may be a part of the sterilizing outfit in use at the time of the operation; to private house surgery, where, during etherization, the patient's head, perhaps from necessity, is located dangerously near to a burning gas or coal range, the kitchen having been transformed into an emergency operating room; to anxious assistants and friends who, while some surgical procedure is being carried on, are obliged to hold the light for the operator.

Cauterization about the cervix and perineum, by means of an open flame cautery, may be dangerous, if the cautery is brought close to the surface of the table, especially if the patient is in the lateral or Sims's position. Still more dangerous is cauterization of the thorax, neck, or face. A screen should be used when possible, for even though the mask is laid aside, the ether exhaled by the patient is inflammable.

If the unexpected should happen and the vapor ignite (and once in a lifetime is enough to make a profound impression upon the operator), the flame should be quickly and methodically smothered, beginning at the patient's face. The fire will be everywhere in the twinkle of an eye. Water, unless used in large quantities, has almost no effect except to agitate the trouble. A can of ether, an ether mask, or sponges saturated with ether, should not be thrown to the floor or kicked around during excitement. They may seriously enhance the destructive process, or even set fire to clothing and other fabrics about the room. Stamping out the flame, here and there over the floor, while somewhat effective,

may easily ignite the trouser leg and still further increase the fire.

Dexterity, and good judgment well displayed, will, with the above directions, clear up the worst situation. Satisfactory results, following the various caualties of the operating room, however, are usually traceable to good fortunate rather than careful management, since many physicians and nurses are not at home in the presence of sudden and unusual danger threatening human life.

## ARE COCAINE SOLUTIONS INJURED BY BOILING?*

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That solutions of cocaine salts have their anesthetic properties injured by boiling seems to be a belief rather generally accepted by the medical profession, and is so taught in the medical schools, schools of pharmacy, and nurses' training schools.

Some writers on ophthalmology and ophthalmic surgery give us no definite information on this point; some tell us that boiling is injurious, while a few, usually very guardedly, say that they have boiled these solutions to render them sterile.

Having read many of the indefinite and conflicting statements of these authors, and knowing that all my friends were afraid to sterilize their cocaine solutions by boiling, I determined to satisfy myself on this point, although it had been my practice for several years to boil these solutions before using them in any serious surgical operation.

The solutions used in these tests has been those of cocaine muriate, of 4 per cent. strength. They were not boiled in a water-bath, but over an Argand gas flame in my office.

I have found that the boiling was most conveniently done by placing a half ounce of the solution in an ounce bottle, which should be loosely corked with cotton during the boiling. Grasp the neck of the bottle with a long dressing forceps and bring it down over the flame slowly, so as not to break the bottle by rapid heating. When large bubbles begin to rise through the solution boiling has begun and it should be thus continued for the desired time.

This boiling naturally produces evaporation of the water and concentration of the solution. This concentration was not interfered with in test solutions No. 1 and No. 2, but in test solutions No. 3, No. 4, and No. 5 sterile water was added after each boiling to restore the volume and adjust strength of the solution.

I have not hastened in making these observations, but allowed several weeks to intervene between the first and last boilings of each solution, thinking that time might augment the destructiveness of the boilings.

Solution No. 4 had been in my office for two months and given no particular care before it was placed in the test.

In none of these tests have large quantities of the solution been used. When foreign bodies were to be removed from the cornea, or when the conjunctiva was to be manipulated or incised, I usually employed two instillations of one or two drops each, with an interval of two or three minutes. In cases in which the anterior chamber was to be opened, I usually used not more than five instillations at intervals of one and a half to two minutes.

### SOLUTION NO. I.

This solution was secured from the druggist on April 15, 1914, and used in two cases to prove its anesthetic value before boiling.

On April 17 it was boiled in the bottle for three minutes; on April 20 and again on the April 23 it was used in the removal of foreign bodies from the cornea. On April 24 it was used in the extraction of a senile cataract.

April 25 the solution was boiled a second time for three minutes. On April 28 and May 1 pupils were dilated preparatory to examination of the fundus. On April 30 it was used in the removal of a foreign body from the cornea.

May 4 the solution was boiled a third time for three minutes, after which it was used as follows: May 4, in the removal of a foreign body from the cornea. May 11, in needling a soft cataract.

### SOLUTION NO. II.

This solution was purchased May 15, 1914, and used to test its anesthetic value, after which it was boiled three minutes. May 17, this solution gave satisfactory anesthesia for the extraction of a senile cataract.

May 18 the solution was boiled the second time. May 20 it was used in the removal of a foreign body from the cornea.

May 21 this solution was boiled a third time for three minutes. May 22 it gave satisfactory anesthesia for the removal of a foreign body which was imbedded in the cornea.

After this trial the remaining portion of this solution was poured into the bottle with the remaining portion of solution No. 1 and the combined solutions were boiled for three minutes. This solution, which had now been boiled four times, gave good anesthesia on May 25 and 26 for the removal of

*Read before the Ophthalmic Section of the New York Academy of Medicine, February 15, 1915.

foreign bodies from the cornea. More boilings were impossible because of the small amount of solution remaining.

SOLUTION NO. III.

This 4 per cent. solution of cocaine muriate was purchased on May 29, and on June 1 it was boiled over a gas flame for three minutes, after which sterile water was added to replace the evaporation and restore the strength of the solution. This solution then gave good anesthesia as follows:

June 8, for the removal of a foreign body from the cornea. June 9, for cauterizing a corneal ulcer with phenol.

June 10 the solution was boiled a second time for three minutes and water added to replace the evaporation. The solution then gave satisfactory anesthesia as follows:

June 11, for removal of a foreign body from the cornea, in two cases. June 15th, for incision of the cornea in removing a membranous cataract.

June 18 this solution was boiled the third time for three minutes and water added to replace the evaporation. The same day this solution was used in the removal of a foreign body from the cornea, and also for cauterizing an ulcer of the cornea.

June 19 the solution was boiled for the fourth time for three minutes and water added to replace the evaporation. It was then used on the 27th and 29th of June for the removal of foreign bodies from the cornea.

June 29th the solution was boiled for the fifth time and water added as before. July 2 it was used as the anesthetic in two cases of removal of foreign bodies from the cornea.

July 3 the solution was boiled the sixth time for three minutes and water added to replace the evaporation. It was then used as follows:

July 3, for tenotomy in one case and for dilating the pupil in another. July 4, for cauterizing an ulcer of the cornea with phenol.

July 6 the solution was boiled the seventh time and water added as before. Its use then gave satisfactory results as follows:

July 6, for the use of the tonometer. July 9, for the removal of a foreign body from the cornea. Sept. 9, for dilating a pupil for fundus examination.

SOLUTION NO. IV.

This solution has been on my office treatment table since May 17, 1914, and had been used several times for various purposes.

July 18 it was boiled in the bottle over a gas flame for three minutes, after which sterile water was added to replace the evaporation. The solution was then used with satisfaction in the following cases:

July 21, first, in the removal of a foreign body from the cornea; second, in a discission operation; third, in the extraction of a senile cataract. July 22 and July 30, in the removal of foreign bodies from the cornea, in four cases.

July 31 the solution was boiled the third time, and water added as before. It was then used satisfactorily in the following cases:

August 19, in the removal of a foreign body from the cornea. August 20, in a tenotomy operation.

August 20, after the above use, it was boiled for the fourth time and water added as before.

August 22 it gave good anesthesia for the removal of a foreign body from the cornea.

August 30 the solution was boiled the fifth time and water added as before. It was then used in the following cases:

August 31, in dilating a pupil for examination of the fundus. September 3, in removing a foreign body from the cornea. September 8, in a tenotomy operation.

September 9 the solution was boiled for the sixth time and water added as before.

September 10 and September 15 the solution produced satisfactory anesthesia for the removal of foreign bodies from the cornea.

September 24 the solution was boiled for the seventh time and wated added as before. After this boiling the solution was used as follows:

September 27, in the removal of a foreign body from the cornea. October 1, in cauterizing a corneal ulcer with phenol.

After these uses the small remaining portion of this solution was added to the remaining portion of solution No. 3 (each having been boiled seven times), and the combined solution boiled three minutes as before and sterile water added to replace the evaporation. This solution then gave good anesthesia in the following cases:

October 3, in cauterizing a corneal ulcer with phenol.

October 7, in applying a tincture of iodine to an ulcer of the cornea.

October 8 and October 10, in applying a one per cent. solution of mercury bichloride to an ulcer of the cornea.

October 28, in the removal of a foreign body from the cornea.

October 29, in curetting and cauterizing an ulcer of the cornea.

SOLUTION NO. V.

This half-ounce solution of cocaine muriate was purchased on November 17, 1914, and soon after used to demonstrate its anesthetic value.

December 4, it was boiled in the bottle over a gas flame for *fifteen* minutes, which reduced its volume to less than one dram; then sterile water was added to restore the volume of the solution to the full half-ounce.

December 11, two instillations, of one drop each, of this solution allowed an imbedded foreign body to be removed, without pain, from the cornea.

December 21, and again on December 31, the experience of December 11 was repeated.

Also on December 31, two instillations of this solution, with an interval of a few minutes, produced good dilation of the pupils for fundus examination, in an elderly man.

January 2, 1915, this solution was boiled as before, but for a period of *twelve* minutes, which reduced its volume to not more than 15 minims; then sterile water was added to replace the water evaporated by the boiling. This solution was then used satisfactorily in the following cases:

January 9, for exploring the upper conjunctival fold for a foreign body. January 11, in removing a foreign body from the cornea; in this case pronounced dilation of the pupil was produced. January 14, in a case of tenotomy where large dilation of the pupil was also produced.

February 4 this solution was boiled for *fifteen* minutes, when only a few minims remained; then water was added to replace the evaporation. This solution then produced satisfactory anesthesia as follows:

February 8, for cauterizing an erosion of the cornea with phenol. February 10, for the use of the tonometer.

In solutions No. 1 and No. 2 the repeated boilings greatly concentrated the solutions, so that they were finally very much more than 4 per cent. in strength. To solutions No. 3, No. 4, and No. 5 I have been very careful to add sterile water after each boiling so as to retain practically a 4 per cent. solution for use.

To recapitulate: Solutions No. 1 and No. 2 were each boiled on four occasions for periods of three minutes, making a total boiling of twelve minutes. Solutions No. 3 and No. 4 were each boiled eight times for periods of three minutes, making a total boiling of twenty-four minutes. Solution No. 5 was boiled for periods of fifteen, twelve, and fifteen minutes, making a total boiling of forty-two minutes.

In no case have I failed to secure the desired anesthesia with a small amount of the solution. Also there have been no undesirable effects, such as irritation of the cornea or conjunctiva, and the healing of surgical wounds has not been interfered with in any way.

Hence I am fully convinced that frequent or even prolonged boilings of solutions of cocaine muriate do not injure or destroy their anesthetic value, nor does it make them more dangerous to the tissues to which they must be applied in ophthalmic surgery.

350 WILLIS AVENUE.

## CONGENITAL CYSTS OF THE NECK.*

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From the scantiness of the literature upon congenital cysts of the neck region, I think this subject has been far too cursorily considered by the medical profession. The conditions are not so rare that we should place this as a shield for a mistaken diagnosis, and worst of all for a radical blunder in treatment, which would most surely only aggravate the existing pathology.

These are pathological conditions, which from outward appearances and clinical pictures may seem very simple, but when explored at the operating table may prove to provide one of the most delicate of dissections and perplexing of operations.

Ascheron, in 1832, was the first to discover that congenital cysts and sinuses of the neck had connection with fetal branchial clefts. A little later Roser and Koenig did some valuable work along this line, by which they proved beyond a doubt that the above discovery was correct.

In the four weeks fetus there are four branchial clefts, which correspond to the gills in the fish. The tissues separating these clefts are termed branchial bars. All these clefts should become completely obliterated, or, in other words, the arches or bars separating the clefts should coalesce (with the exception of the first cleft which forms, practically speaking, the canals opening into the pharynx), leaving the neck perfectly smooth. If nature fails in any of these particulars, there is produced a a congenital cyst, a fistula, or both. In the fistula formation the opening may present itself either externally, or internally, or both.

In the fifth week of embryonic life we find a small vesicle on the back of the tongue. By the eighth week, the first appearance of glandular tissue appears. This is the developing thyroid gland, which shows attempt at secretion as early as the fourth month of fetal life. There is then a functionating thyroid gland at this stage of embryonal life, although situated on the back of the tongue.

*Read before the Sullivan County Medical Society, April 7, 1915.

The gland slowly passes down to its normal resting place through the thyroglossal duct, and this passage is obliterated behind it. Normally, nothing remains of the lumen of this duct, but when nature fails to do her duty again we have developed a congenital abnormality. If some of the thyroid cells are dislodged from the gland and remain along the duct, these may develop into accessory thyroids, which usually cause no trouble, unless they become diseased. This duct may fail to be obliterated, either partially or totally, causing the existence of a cyst or fistula. These fistulas open externally in the median line of the neck, and are termed by some "median fistula" to differentiate them from the branchial sinuses mentioned before. They are usually called thyro-glossal cysts and fistulas.

Roser classifies the conditions arising from an unobliterated branchial cleft under three heads: First, branchial fistula, when the entire tract remains patent, there being both an internal and an external orifice. Second, cystic fistula, when one end of the tract is closed. Third, branchial cyst, when the ends of the tract are closed, the intermediate portion remaining open. According to Sutton, the external opening of the branchial cysts and fistulas are usually along the anterior borders of the sterno-mastoid muscles.

These conditions, as all congenital afflictions, have no definite period for making their clinical appearance. While they usually become noticeable about the age of puberty, they very frequently are recognized by the parents in early childhood and infancy. Yet they may lie dormant for years and suddenly start up in adult life with one of three tendencies: First, to cystic formation, causing the patient to seek relief from pressure symptoms, or for cosmetic reasons. Second, to sinus formation with more or less constant discharge, which is a continuous annoyance and embarrassment. Third, to a malignant development. The size of the cysts depends upon the rapidity of the accumulation of its fluid contents, and the length of time elapsed before treatment is sought or a spontaneous fistula is established.

Why these ducts should not completely close is not perfectly clear. Some believe it is because of the inclusion within their walls, or we might say the misplacement into their walls of foreign tissue cells derived possibly from the ectoderm or entoderm, which, following the course of all such anomalies, develop later into pathological conditions.

Dermoid cysts are entities which develop in the floor of the mouth and are very easily mistaken for ranula. They may also, when developed to considerable size, form a prominence below the chin in the midline. They develop very slowly and are usually painless.

Lymphatic cysts of the neck are not included by some under congenital cysts of this region. They are lymphatic cystic tumors, which may develop considerable size, even extending below the clavicle. They are usually lobulated, situated at the sides of the neck in the region of the lymphatic chains, extending at times in a neoplastic manner, invading the muscular layers and sometimes infiltrating the muscles themselves.

The diagnosis in the majority of these cases is not difficult. The occurrence of a cystic tumor in the front portion of the neck should at once cause the suspicion of a congenital condition. While small, they cause no symptoms, and sometimes may become quite large without giving any inconvenience, although others not so large may cause the patient to seek relief from pressure symptoms. They are usually hard, but may be rather fluctuant, the skin being freely movable over the tumor with no discoloration or tenderness. They seldom become infected, until an opening has been made, or has formed spontaneously. If infection occurs, they rapidly increase in size, and produce the ordinary symptoms of infection. If the purulent contents are not released by incision a fistula soon develops, which, from that period, more or less constantly discharges. They are movable in a transverse direction, but not vertically. When the diagnosis is doubtful a hypodermatic needle will demonstrate the cystic properties of the growth. If an external orifice has already formed when the case first presents itself for treatment, we may be able by passing a probe very cautiously, to locate the cyst and ascertain the size of the cavity, and possibly be fortunate enough to pass the probe into the sinus leading to the internal opening if there be one.

The treatment can be expressed in two words: total extirpation. However, this is much more easily said than done, especially when there is an internal orifice, or a sinus leading almost to the pharyngeal wall. In dealing with the simple branchial cyst, without sinus formation, the skin over the tumor is cautiously incised, being careful not to enter the cyst cavity. The entire wall is completely dissected and removed *in toto*. The wound can be closed without drainage. Should there be an external opening with sinus, the skin incision must then be elliptical, surrounding the orifice, removing with it a narrow margin or normal skin on either side, extending the incision to the desired points on either side for easy removal of the sinus

and cyst. A probe in the sinus aids in its dissection. In these cases where the contents have been allowed to partially evacuate, and the walls are more or less lax and collapsible, the dissection will be made much easier by distending the cavity with some methylene blue solution before the operation. This stains the cyst wall, making it more easily recognized.

When there exists a sinus ranging from the cyst inward, then the operation becomes very difficult and at times a total extirpation of the entire tract becomes an impossibility. In the branchial type the internal sinus is carefully dissected from the surrounding structures. Koenig follows it by blunt dissection almost to the mucous membrane of the pharynx; then with a Whitehead speculum in the mouth, he passes an eyed probe into the sinus, making it enter the pharynx. The probe carries a silk thread, which is brought out through the mouth.

The sinus is then severed a short distance from the internal orifice, tied to the thread and by pulling on the thread through the mouth the sinus is inverted into the pharynx. With two sutures it is fastened to the mucus membrane, and the redundant portion cut away. The cyst is removed and the wound closed as in simple cases.

When the median or thyro-glossal cysts are complicated by an internal sinus, the task may be difficult also. The duct sometimes passes through the hyoid bone and in order to obtain a permanent cure it must be completely removed from its bony canal, or perhaps it will become necessary to excise a portion of the bone itself.

When the walls of these cysts are very thin and closely adherent to the vessels and nerves of the neck, their removal becomes very tedious and sometimes impossible, and yet only a total dissection of the entire sac will effect a cure. If any portion of the secreting lining be left behind, the condition will positively recur. It is for this reason that simply drawing out the contents of the cyst, or following the aspiration by injections of irritants or caustics, always results in failure. If the contents are sterile at first the aspirating needle may do harm by introducing infection.

CASE: Miss M., age 15, came to the hospital Aug. 29, 1914. When she was about three days old her mother noticed some oozing from a pin point opening at the inner border of the right sterno-cleido-mastoid muscle about the junction of the lower and middle third. The opening never healed and constantly discharged a thin, whitish fluid, very small in amount. It never gave any trouble with the exception of the drainage, which required frequent use of the handkerchief to keep the fluid from trickling down the neck. A soft tumor the size of a hickory nut was found above the small orifice. A very fine probe could be passed for an inch and a half to two inches upward through the opening, and, by rotary movement, a cavity demonstrated the walls of which were very sensitive. Before making the incision, the sac was tightly filled with sterile methylene blue solution, so that the blue cyst wall could be easily detected from the surrounding tissues in the dissection. An incision was then made over the cyst and around the sinus opening. With a small probe in the sinus, it was first freed and the dissection continued, very cautiously, freeing the cyst by blunt dissecting. At the upper end of the cyst a sinus led upward. A fine probe passed through it to its termination, which was almost to the right tonsil, and the tract was then carefully freed and removed *in toto*. The wound was closed without drainage.

## FIBRO-LIPOMA.

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Notwithstanding the anatomic, histo-pathologic, and bacteriologic investigations which have been prosecuted during the last few decades, nothing particularly new has been developed concerning either the histogenesis or pathological characteristics of lipoma. However, reports of isolated cases are always interesting, especially where the neoplasm possesses unusual features, as in the example to be described herein.

Literally, lipoma signifies a strictly benign neoplasm in any anatomical situation characterized by an abnormal overgrowth (hypertrophy) of adipose tissue. Warthin limits application of the term to "circumscribed proliferations of adipose tissue which show a certain anatomical and physiological independence of the neighboring tissue, even when the latter is fat tissue." Progression in development may occur either peripherally or from different portions of the neoplasm, fibrous connective tissue being first formed, which by metaplasia subsequently becomes fat tissue.

According to the foregoing definition, the custom prevailing among authors of designating as lipomata certain neoplasms not composed of connective tissue—simply because the cells show fatty degeneration, or that the tumors contain a superabundance of fatty elements—would appear totally unwarranted. True lipomata are mature connective tissue neoplasms, *i.e.*, "the tissue of which they are composed is of the type of adipose tissue." On the other hand, however, the observation is worthy of note that other tissue elements may be incorporated within the neoplasm, *e.g.*, when fibrous trabeculae develop to such an extent that they become predominant features, the neoplasm is designated as a fibro-lipoma; with an unusual admixture of myxo-

matous elements, the term myxo-lipoma may be correctly applied; osteo-lipoma, chondro-lipoma, lipo-sarcoma, telangiectatic lipoma, and lipoma cavernosum have also been suggested as appropriate to represent other forms which possess characteristic features.

According to its manner of development the neoplasm may be single, circumscribed, lobulated, multiple, symmetrically multiple, or diffuse. In the latter type (lipoma arborescence of Müller, *et al.*), numerous ramifying branches may extend in various directions. Lipomata more frequently than otherwise develop in anatomical situations where the fat tissue is normally most abundant. They may be subcutaneous, subserous, submucus, intermuscular; they also develop about the kidney and other internal organs, the peritoneum, joints, periosteum, pleura, tendon sheaths, meninges, etc. The most common type is essentially an elastic, lobulated, circumscribed, encapsulated, freely movable neoplasm (hypertrophy) of the subcutaneous areolar tissue; the serous, osseous, and other structures are less frequently implicated. While the majority of circumscribed and lobulated lipomata are distinctly encapsulated, this is obviously untrue in the diffuse type, particularly where the neoplasm develops beneath the pleura, the peritoneum, in the synovial membranes, etc.

The regional distribution of subcutaneous lipomata and fibro-lipomata may be mentioned in the order of their frequency as follows: the neck, back, gluteal region, thighs, axillae, anterior abdominal wall, arms, hands, feet. Strange as the observation may appear, the face and scalp are rarely implicated in lipomatous enlargement, the reason for which has never been definitely determined; and why the palmar aspect of the hand suffers more frequently than the sole of the foot also remains unexplained. Several years ago Grosch collected from the literature more than seven hundred examples of single subcutaneous lipomata, the regional distribution being: the neck, back, thigh, forearm, volar aspect of hand and foot.

In connection with the etiology, the pertinent anatomical fact must not be permitted to pass unobserved that in the embryo the subcutaneous areolar tissue is formed by "cell-islets" separated from each other by connective tissue, each fat lobule being provided with an independent blood supply. It is claimed that displacement or inclusion of these fat-forming centers is responsible for the origin of lipoma, the neoplasm being therefore congenital. Although the development of lipomata is rare before adolescent life, a few examples have been observed during infancy and early childhood, *e.g.*, Black removed (by celiotomy) a lipoma weighing nearly ten pounds from the abdomen of a child less than two years old, the neoplasm occupying practically the entire abdominal cavity.

Even admitting the premise that lipomata are of congenital origin, there has hitherto been suggested no tangible nor understandable hypothesis to explain why in one instance there occurs "displacement or inclusion of the fat-forming centers," whereas in ten thousand others the congenital causative factor remains inoperative, and the phenomenon is consequently not produced. About the limit of present understanding is that "lipoblastic displacement results from disturbed embryo-genesis." This, however, merely represents a manner of expression to illustrate a well understood anatomical or histological fact, and utterly fails in elucidating the essential etiological factor, since nothing is suggested to adequately explain why the so-called disturbed embryo-genesis ensues.*

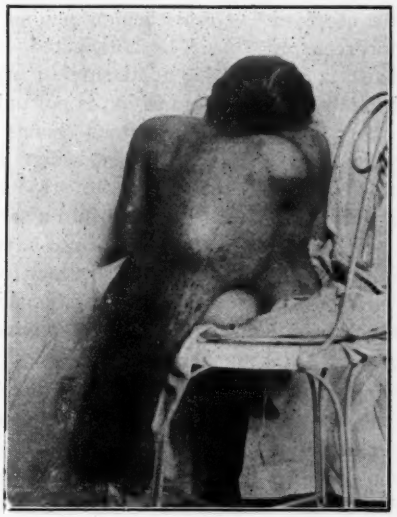

Fig. 1.

The development of lipomata is almost invariably slow, and as a rule they remain practically painless until supervention of inordinate pressure upon subjacent structures, and in the majority of instances the patient seeks medical or surgical aid for purely cosmetic reasons. Pressure from large neoplasms may sometimes induce marked pain and also serious

*The fact that lipomata have been noted in more than one member of the same family has induced the belief prevailing in some quarters that the imperfectly understood and intangible influence of heredity must be an important etiological factor. The hypothesis of hereditary influence has hitherto been vastly overworked in attempted explanation of mental, physical, and moral obliquities, the etiology of which seemed submerged in obscurity. The admission that anatomical deviations and pathological characteristics are hereditary implies that, at the time of fructification, either the ovum or spermatozoon must be similarly afflicted. The pertinent fact appears to have been overlooked that imperfect (diseased?) germ cells are incapable of being fructified; this represents one of the immutable embryological laws.

functional disturbances. Neuralgia and trophic skin manifestations have been noted in connection with multiple lipomata. Occasionally the patient complains of pain within the neoplasm, due either to the formation of new nerve fibers or because the tumor implicates connective tissue sheaths of nerve trunks. Ulceration, sloughing, infection, hemorrhage are late manifestations.

The treatment of lipomata is purely surgical. In the subcutaneous type, if operative extirpation be accomplished prior to the advent of complications (infection, hemorrhage, sloughing, etc.), there should be no immediate nor remote mortality. Since the neoplasm is strictly benign, neither metastasis nor recurrence need be anticipated. Where there exists a considerable admixture of myxomatous elements, malignant transition is not unknown. Senn states that while sarcomatous change is less frequently observed than in other benign tumors, "myxomatous degeneration of the stroma often initiates the transition of a lipoma into a sarcoma." Although Waldeyer and others claim to have noted metastasis in myxo-lipoma, the accuracy of their observations seems exceedingly questionable, and more than likely the neoplasms were sarcomata containing an unusual number of fat cells.

The statement cannot be too strongly emphasized that even the simple surgical procedure required for the extirpation of a subcutaneous lipoma should be executed under the most rigid asepsis and aseptic technic. It is of the utmost importance that the exposed surfaces be adequately protected and infection of the wound prevented, otherwise serious complications may ensue, followed by death of the patient from progressive pyemia.

In single or even multiple small subcutaneous neoplasms, extirpation may be successfully accomplished under local anesthesia; but where the tumor has attained the dimensions of the one represented by the accompanying photographs, the operation may be more satisfactorily executed with the patient under the influence of a general anesthetic. Care must be exercised to avoid laceration of the tissues, and also to secure complete hemostasis. In the majority of instances the wound may be closed without drainage.

While in the larger percentage of cases fatty tumors do not attain huge proportions, several examples of mammoth lipomata and fibro-lipomata have been encountered. According to Senn, such neoplasms weighing more than ten pounds are exceedingly rare. Among the older writers Chipault (Rötter) mentions a parietal lipoma, which attained the extraordinary length of three feet and three inches, extending to the patient's knees. The tumor developed "in the left parietal region and was covered by the skin of the whole left side of the face and forehead; the left ear was plainly visible in the upper third of the growth."

Brander removed a fibro-lipoma weighing fifty pounds, which had progressively enlarged for eleven years. It represented an enormous mass suspended from beneath the left scapula. Rhodius records an example in which the neoplasm weighed sixty pounds. A subserous lipoma removed by Carlsberg weighed thirty-five pounds and was "partially petrified." Terillon describes a subperitoneal lipoma weighing fifty-seven pounds, and two "large

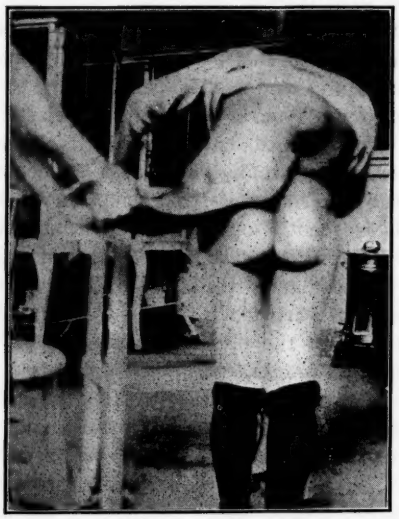

Fig. 2.

tumors" of similar type are mentioned by Homans. Meredith successfully enucleated an omental lipoma weighing fifteen and a half pounds, and Förster encountered one which weighed fifty-three pounds. Waldeyer mentions a lipo-myxoma of the mesentery weighing sixty-three pounds, and Stiegele removed a ten-pound lipoma from the vulva.*

McGuire reports the removal of a lipoma weighing twenty-two pounds from the shoulder of a colored man aged 40 years. The tumor was first noticed four years previously, and had rapidly increased in size, but had caused no pain. The wound was perfectly healed the tenth day after the operation.

More recently Little (China) reports an interesting observation under the captain of "A Spectacular Case of Lipo-Myxoma." The patient was a

*For the data concerning many of the older observations the writer is indebted to the admirable work of Gould and Pyle on "Anomalies and Curiosities of Medicine."

male of 24; neoplasm, left side of face and neck, ten years' duration, began as a small nodule below angle left jaw. Excepting for cutaneous hypersensitiveness and tension from the weight of the tumor, the patient suffered little discomfort until three months prior to operation, when several cutaneous openings occurred. He then had an enormous nodular neoplasm which had to be carried on his arm while walking, and held in his lap while sitting; several cutaneous ulcerations discharging offensive blood-stained fluid; certain areas soft and fluctuating, others hard and resistant; skin over non-ulcerating areas freely movable, the tumor apparently being only slightly adherent.

Operation revealed neoplasm adherent to but not implicating parotid gland and easily removed; weight, thirty pounds; vertical diameter, fifteen and one-third inches; horizontal diameter, eleven and three-quarter inches; circumference, twenty-four and one-half inches. Neoplasm encapsulated by loosely adherent membrane; cross section revealed cysts of various sizes, many enclosed by walls of disintegrating tissue; some contained thick greenish-brown fluid, others semi-gelatinous material; largest cyst occupied center of neoplasm; non-disintegrating portion composed of fat separated into lobules of irregular size and shape.

An extraordinary example of multiple subcutaneous lipomata in a male is reported by Broca. At the age of 25 there appeared upon the thigh a small, fatty tumor which after six years had attained considerable size. Upon excision it weighed five pounds and consisted of ordinary adipose tissue. Five months thereafter numerous small lipomata appeared upon the body surface, "fresh ones" developing from time to time during a period of forty years. When the patient was 70 years old "two thousand and eighty tumors in size from that of a pea to that of a walnut were counted over the body, more minute ones not being included." Microscopical examination of portions of the neoplastic tissue removed during life gave the appearance of lipofibroma. The patient developed dysphagia and perished from starvation. Necropsy revealed a large fatty neoplasm surrounding the esophagus, occluding its lumen, and the pylorus was similarly involved. Fatty deposits were also found in the cardiac valves, deep tissues of the neck, sheaths of the carotid vessels, etc. "It is difficult to explain such a case as this except on the ground of a congenital anomaly" (Warthin).

The following personally observed case seems worthy of record:

P. Z., female, aged 42 years, white, unmarried; height, four feet and eleven inches; weight, eighty-seven pounds; a hunchback. Father died of senility at the age of 84. Mother died at 60 from la grippe, duration seven months; she coughed during this entire period; no expectoration; at the age of 50 was operated upon for strangulated hernia. Three brothers living and healthy. Two brothers dead, one at 9 years from pneumonia, the other at 27 from "pulmonary hemorrhage," duration of illness one year. Family history negative in all other respects.

In early life the patient had measles and pertussis; no history of any other disease. At the age of 9 years she fell from stable loft and sustained a slight injury to her back, but did not mention the accident to her parents. She says that about a year later "a lump" appeared in the lower dorsal region, but "upon professional advice things were left to proceed at will." The patient had never menstruated, although her genitalia seemed normal; nor had she suffered any inconvenience whatsoever from non-establishment of the menstrual function. According to her statement she had always enjoyed normal physical health.

Fig. 3.

Twenty-five years ago (*i.e.*, when 17) she first noticed an enlargement just posterior to the left post-axillary fold, but as no pain nor inconvenience resulted therefrom, she made no mention of the tumor to anyone. She says that "matters were allowed to progress, and that her secret was kept because she did not confide in anyone," until November, 1913, when the tumor had attained the size shown in the accompanying photograph. About that time, when lying in bed, a sudden and copious hemorrhage occurred from about the center of the neoplasm. This finally ceased without extraneous aid, but not until the patient had become considerably exsanguinated.

This woman was brought to Louisville and came under my observation November 10, 1913. Three days later the tumor, which weighed ten and three-

quarter pounds, was removed under general anesthesia. The patient at that time was markedly cachectic in appearance. When she assumed the erect posture the tumor extended to four inches below her knees, from a point just posterior to the left post-axillary fold about on a level with the third rib. Because of the weight of the neoplasm the third and fourth ribs were separated about four inches. The tumor was nourished by one large blood-vessel, and was found intimately connected with the pleura between the third and fourth ribs. It was destitute of any definite capsule. Sloughing and hemorrhage were probably due to the weight of the neoplasm; the situation of the slough may be seen near the center of the photograph. Attention is especially directed to the length and contour of the tumor. Over the right scapula will be observed another and independent neoplasm, which was left undisturbed on account of the unfavorable condition of the patient which developed after she was placed upon the operating table. She rallied promptly from the operation, however, and convalescence progressed normally until December 13, when there occurred a slight rise in temperature, which subsided within three days. A more marked general cachexia or jaundice later ensued, and the patient perished from asthenia January 3, 1914. No autopsy permitted; laboratory finding, fibrolipoma.

As in other lipomata involving similar anatomical situations, the patient experienced little discomfort from the presence of this large neoplasm; she merely complained of a dragging sensation from the suspended weight when assuming the erect posture. Surgical relief was not sought until sloughing and hemorrhage ensued.

The result in this case directs renewed attention to the importance of early surgical extirpation of all fatty tumors. Where the aid of surgery is invoked before complications have ensued, a favorable ultimate outcome may be confidently expected.

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## SCOLIOSIS.

Backache is the most important symptom complained of, and every case of backache should be examined with the object of finding not an already developed deformity so great that a layman could detect it, but a developing deformity, with a recognition of the slightest deviation from the normal.—CHARLES OGILVIE in the *New York Medical Journal.*

# THE RADIUM TREATMENT OF CANCER OF THE CERVIX OF THE UTERUS.

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The results of radium treatment of carcinoma of the cervix uteri are so promising that it is worthy of special consideration, but it is first necessary to remember the limitations of radium.

So far as is definitely known at present, the action of radium is purely local. It has no effect, adverse or favorable, in the formation of metastases. One cannot expect from it, therefore, in the present stage of knowledge, any effect on a distant secondary deposit. There may be a future in general treatment by radium, but this does not seem to lie in the administration of radium itself, but rather, as suggested in the Middlesex Hospital Reports, in the injection of radiated cancer cells, or the modification of a primary local dose of radium to produce a similar effect. Practically, therefore, local treatment can alone be considered now.

It is probable that the original idea of an almost unlimited range of action for radium rays is wrong. It seems likely that "Beta" and "Gamma" rays are effective in destroying cancer cells at a comparatively short distance. Thus, when sections of malignant tissues are examined, which have previously been irradiated, they show:

(1) Near the location of the tube, a complete local destruction of all tissues;

(2) At slightly increased distance after an interval there is a more or less gradual destruction of cancer cells with increased growth of connective tissue;

(3) Still more distant there is only partial destruction of malignant cells, but still overgrowth of connective tissue;

(4) Finally, one passes to a distance at which the radium has had no effect.

It has not been possible so far to measure those distances. This difficulty arises because of the large number of factors involved in radium treatment; thus, some tumors react more readily than others, in addition to which the amount of radium used, the thickness of the metal screen surrounding it, and the time of exposure are all variable factors.

When radium was first used in malignant disease it was customary merely to place it in contiguity with the tumor to be treated. It was difficult then to exhibit adequate dosage without marked local inflammation and destruction of the vaginal mucous

membrane. Tubes of radium were merely placed in the vagina, and had to be surrounded by a thick screen of dense metal—e. g., 1.5 to 2 mms. of lead or platinum, which cut off the less penetrating but more irritating rays. This reduced the active rays by an enormous percentage. Unfortunately, in their passage through metals, radium rays produce secondary irritating ones which vary in numbers roughly with the density of the metal screen employed, so the screened tube had to be enclosed in India-rubber about 2 mms. thick to cut off as far as possible the secondary rays.

Even under these circumstances exposures had to be limited to 24 hours, and then sometimes a moderately severe vaginitis would occur. With this method much amelioration of symptoms often occurred, but it was recognized that something more was wanted.

It is well known that skin and mucous membranes react the most markedly of any tissues to secondary or other irritating rays. It thus becomes obvious that instead of using very thick screens, which reduce the effective energy of the radium enormously, thinner screens could be used by employing the tissue of the tumor as a screen. Thus the rays previously cut off could act on the tumor surrounding the tube, which in its turn would screen the more distant and irritable tissues. In this way even the secondary radiation from the metal would serve a useful purpose. Moreover, an appreciable percentage of very penetrating rays are cut off by thick screens.

So radium in doses of 25 to 50 mgs. of the metal in a cylindrical screen of 1 mm. of silver (which cuts off all beta rays) were introduced into the canal of the cervix. The same exposure of 24 hours was continued and results improved. Ulceration cleared up more rapidly and a number of cases became operable.

As mentioned, however, the range of effective action of radium rays is limited and with the use of a single central tube outlying malignant processes tended to escape with little alteration. It therefore became necessary to try to produce a more even radiation throughout the tumor.

Stevenson of Dublin had this idea in view when he started using radium emanation in small steel needles, the walls of which are 3/10 mm. in thickness. He maintained that it was necessary to use the softer and more destructive rays and that this could be done by employing small doses of 4 to 10 mos. in each needle. These needles, in form like a serum syringe needle, are easy of introduction and a number of them can be pushed into a tumor very readily.

It follows, however, from the small quantities of emanation used, and the high proportion of soft rays employed, that these needles must have a very limited distance efficiency although very potent locally. Thus great care must be taken not to have the needles too near together (Stevenson recommends about 2 cms. between them) otherwise a very violent local reaction is apt to occur.

It seems, therefore, that to some extent the needles fail to produce that evenness of radiation which is desired, and although in many cases they produce very good results, their effect taken as a whole is intensely local.

I accordingly modified my practice to a combination of the older and the newer method, and employed a system which uses a strong central tube in the canal of the cervix, reinforcing its action on notable outlying malignant processes by means of the needles. This method has also the advantage of appearing to be safer.

Thus, suppose the case to be treated has ulceration of the cervical canal, much thickening of the posterior lip, and a hard mass in the left broad ligament. A tube of 50 to 60 mcs. of emanation, or a like quantity of a radium salt contained in a cylindrical screen of silver the wall of which is 1 mm. thick, is placed entirely in the cervical canal. Two or three needles are pushed into the peripheral part of the posterior lip, and two or three, according to the size of the tumor, are introduced laterally into the base of the left broad ligament. The whole series of tubes is kept in position by packing the vagina with sterile gauze. After 24 to 48 hours the tubes are removed. The vagina is douched once or twice daily for six weeks afterwards to prevent the possible formation of adhesions.

The small sharp platinum tubes of 0.3 mm. wall thickness, as used at the London Radium Institute, may be employed in the same way as the needles. They have a greater range of action, but need much more emanation, and are more difficult to introduce.

It would seem that the above method produces better the even radiation desired, and distant troublesome foci are effectively dealt with.

It has been stated above that at present only the local action of radium can be used, and although every effort must be made to make the local effect of the rays as wide as possible, nothing can be done for secondary abdominal glands. This leads the way to taking a wider view of what should be done in all cases of inoperable carcinoma of the cervix. Unless the surgeon has grown pessimistic about his results, radical amputation of the uterus should always be performed when possible.

It is, of course, only to be expected that these cases which are just beyond operation should do the best with radium. Some patients whose disease is much more advanced, however, respond in a remarkable manner, while some, not apparently so hopeless, do not improve so much.

It is difficult to find a reason for this discrepancy. It may be said that in some patients the resistance to cancer is greater than in others, and that their connective tissues respond more readily to stimulation and rapidly takes up the work of repair. This may certainly be a factor because it is notorious that radium is much the least happy in its results when the tumor to be treated is situated in the midst of dense old scar tissue, or is adherent to bone, with or without damaged skin stretched tightly over it. In these cases the tumor does not do well and the absence of tissue that can adequately repair defects seems to be the important factor. Thus, a carcinoma of the cervix of great bulk may in effect present these adverse features.

The histology of carcinoma of the cervix is well known to be a difficult study, but its further elucidation might easily be the key of the problem. For, on the whole, those cases of carcinoma of the neck of the uterus which have their origin in the canal and extend chiefly through the thickness of the wall laterally and downwards, even though they form large polypoid growths, seem to respond best, although exceptions to this rule appear to exist. These may be glandular carcinomata even though they may have a tendency to change their form in the vagina.

The type of cancer of the cervix which responds least to radium treatment is that which rapidly grows on to the vagina, and forms a deep ulcer with a high infiltrated edge or invades quickly the greater part of the vaginal wall and makes its upper part or the whole of it a hard, rigid tube. Such cases as these, although there are again exceptions, may hardly even show the ordinary improvement of decreased vaginal discharge and fetor and the stoppage of bleeding and pain.

Fairly frequently in the course of radium treatment a cancer of the cervix seems to disappear almost entirely or an inoperable case looks clearly to have become operable. What line of treatment is it then advisable to take? After two or three treatments with radium it is usually possible to predict what further progress is likely to accrue from the same agent at the site of application. It must then be borne in mind that the object of the physician or surgeon is completely to eradicate the disease. If a secondary deposit, palpable or impalpable, exists in the abdomen, treatment so far has only been palliative, although it may have been successful to a remarkable degree. The rational thing to do, therefore, although unpleasant to the patient, is to open the abdomen in every hopeful case, and proceed as circumstances direct. This counsel of perfection has to be modified somewhat in practice.

The patient may feel perfectly well and reject all experienced advice. This advice cannot be pushed too far because the patient may really be quite free of the disease. Moreover, should some of the cancer or secondary deposits remain, it may be extremely difficult to remove them. After radium treatment there is commonly former around the lower part of the uterus and cervix a girdle of dense fibrous tissue which renders the separation of the uterus from the bladder and the dissection out of the lower parts of the uterus a very difficult matter. It may also be found impossible to remove glands in certain situations. Nevertheless, abdominal section should be performed when there is the slightest chance of removing the disease completely. If on opening the abdomen there are growths quite impossible of removal, tubes of radium, adequately screened, may be buried in them for from 24 to 48 hours but, unfortunately, radium dosage is not yet sufficiently well worked out that one can be sure of removing a growth at one treatment, and repeated laparotomy is not tolerated by patients as a rule. General irradiation of abdominal glands by varnished plates of radium screened by 2 mm. of lead and protected against secondary radiation, placed over the abdominal wall for 24 hours is of little real use.

If the metastases be in the liver the case is best left to its natural termination.

Improvements in technic and increase of knowledge give great promise for the ultimately successful treatment of carcinoma of the cervix of the uterus by radium.

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### IGNORANCE OF CANCER SYMPTOMS.

If our people are dying because they do not know, we, the doctors, must teach them. We must teach a woman that a lump in the breast, no matter how small or how painless, may be the starting point of a serious condition and must at once be investigated by a competent physician. We must teach women that irregular vaginal bleeding, the onset of a discharge, etc., may be early warning symptoms of cancer of the uterus. We must teach all people that a mole or a wart which begin to grow, bleed or ulcerate is a danger sign that must be heeded at once. There are similar early signs in other portions of the body that may forewarn people, and of which they should have accurate knowledge.—*Penn. Med. Society Cancer Commission.*

# CANCER OF THE PENIS: REPORT OF TWO CASES.

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PHILADELPHIA.

In a clinical experience of some two thousand cases of cancer in various portions of the body I have met with but four patients in whom the disease was situated in the glans penis. Each of these were instances of epithelioma.

Of the four cases, two were merely examined by the present writer, one patient declining treatment and the other being seen in consultation before a knife operation by a colleague. In the latter of these two cases, a typical instance of warty epithelioma, amputation of the whole organ, including the penile crura, was quickly followed by recurrence and regional extension.

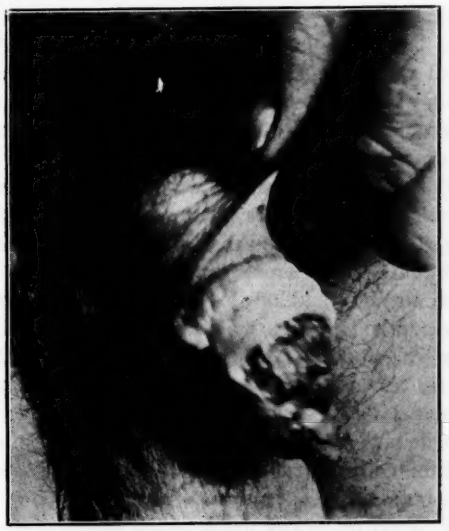

Figure 1. Case II. Before ionic operation.

The remaining two cases, related below, were placed under the zinc ionization method with excellent results. The history of these two cases shows that the disease appeared in one in the scar of an operation for phymosis performed ten years before, and in the other possibly in the scar of a chancre for which the patient was treated 42 years before. The etiological connection between the scars and the new growths is probably remote in both cases.

These two patients represent an early and a late stage of epithelioma of the glans, the late stage including dissemination to a lymphatic gland in the groin. They illustrate the technic of the surgical application of zinc ionization in both stages.

CASE I: Farmer, aged 50, married 26 years, was referred by Dr. Campbell, of East Smithfield, Pa., September 22, 1912. His family history was negative and general health excellent. Syphilis and gonorrhea denied. He had, however, suffered from phymosis since childhood until operated on for this condition ten years ago, the adherent prepuce having been removed from much of the surface of the glans, including the site of the present growth.

In November, 1911, while in Florida, he noticed an itching lump near the frenum, caused, he thought, by the bite of a mosquito. The lump failed to disappear and has grown steadily since, particularly during the last six months. Examination revealed a normal organ except for an elevated, hard, whitish growth near the frenum measuring 2 by 1½ centimeters.

The patient being averse to general anesthesia, satisfactory local anesthesia was carefully induced by injections of a 2 per cent. solution of quinine and urea hydrochloride, and bipolar ionization with the zinc ion was carried to the point of total destruction as follows: Six fine zinc needles were inserted immediately beneath the growth, pointing

Figure 2. Case II. After separation of sloughs and healing of penis, but showing living inguinal gland.

concentrically, connected with the positive pole of the direct current, with a small negative electrode pressed against the center of the growth; and with all electrodes immovably in place a current of 50 milliampères was gradually turned on and maintained for 52 minutes. On separation of the devitalized tissue the wound healed promptly under dressings of dilute zinc oxide ointment without narrowing of the meatus. The patient was seen seven months later with a soft, healthy scar and no sign of disease.

CASE II: Farmer, aged 66, referred by Dr. C. L. Clover, of Clarion, Pa., November 10, 1914. He had always been well except for a sore on the frenum 42 years before which a physician pronounced a chancre. He married later and has had seven healthy children. Two and a half years ago he noticed a white spot on the glans penis. It grew

steadily worse until the whole of the glans was involved, as shown in Figure 1. The carcinomatous mass includes the whole of the glans, but has not extended beyond the neck. In the left groin, however, an enlarged inguinal gland was found, about the size of a small marble.

On November 11, 1914, he was placed under ether and a major bipolar ionization done, with a technic similar to Case I except for larger electrodes. A current of 300 to 700 milliampères was employed for 25 minutes, completely devitalizing the growth up to the neck of the glans. The carcinomatous gland in the groin was now grasped with the fingers through the overlying tissues and an effort made to pass electrodes through the skin and beneath it. With a small negative pole on the skin over the gland 600 milliampères was turned on in this situation for ten minutes.

In the after-treatment special preparation was made for the control of secondary hemorrhage should it develop, but the slough separated at a point that included all disease, without incident, and

Figure 3. Case II. One month after operation. Inguinal wound not yet healed.

also quite painlessly, and the skin edges united under the free use of diluted zinc oxide ointment without further attention. Some concern was felt as to possible narrowing of the new meatus and arrangements were made to insert a catheter, but this was found not to be necessary.

The second photograph was taken November 24 and shows the wound at the end of the penis well healed and healthy. In the inguinal wound the exposed, still living gland is also shown, it having escaped inclusion in the operative ionization. This was readily destroyed at this time by a minor monopolar application without anesthesia, 90 milliampères being used with three needles for half an hour. The third photograph shows an apparently healthy wound, which later healed nicely. The patient reported freedom from recurrence six months later.

1823 WALLACE STREET.

## A NOTE CONCERNING THE SURGICAL RELATION OF THE BLOOD SUPPLY OF THE TERMINAL ILEUM.

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During an operation on a very large ventral hernia with intestinal obstruction and beginning peritonitis, the intestines adherent to each other and to the sac, I found that in freeing the terminal ileum and cecum, I had also separated the last five inches of the ileum from its mesentery.

Since the operation had been long, I feared a resection of the intestine which seemed indicated. The books on intestinal surgery advise: If the small intestine is separated from its mesentery it should be resected, for the arteries of the small intestine are terminal vessels and do not anastomose as do those of the large intestine.

But, I remembered, the blood supply of the terminal ileum is similar anatomically to that of the large intestine. The ileo-colic artery comes off the right side of the superior mesenteric, anastomosing with the terminal or ileal branch of the superior mesenteric to form the ileo-colic loop, which supplies the terminal ileum, cecum, appendix and part of the ascending colon. The vessels supplying the terminal ileum anastomose with each other, so if the ileum is here separated from its mesentery it will be nourished by the vessel anastomosing along the gut.

I therefore sewed the terminal ileum to the torn mesentery with success. I do not believe it was nourished by the omentum, as is reported by one experimenter, who found that in dogs the small intestine could be separated from its mesentery for two inches, if wrapped around with omentum.

That the blood and lymphatic supply of the terminal ileum are the same as that of the ascending colon, is well recognized in operations for carcinoma of the cecum, and it is removed with the cecum and ascending colon in these operations.

February 6, 1911. Mrs. C., 46 years old, mother of one child, was operated on two years before by another surgeon, for pelvic abscess—laparotomy and tube drainage, through the median abdominal incision.

Hernia in the incision followed. The patient came to me suffering with severe pain in the right side of the lower abdomen, which had lasted a

month and was getting worse every day lately. The pain was made worse by eating, which was followed by great distension of the abdomen. Seven days before, there occurred vomiting, severe pain before the bowels moved, and chills followed by fever. Temperature 102°, pulse 110.

The hernia was a large one in the scar through the right rectus near the median line. It was irreducible and very painful on pressure.

Diagnosis: Post-operative ventral hernia with intestinal obstruction and beginning peritonitis.

Operation: The abdomen was opened by transverse incision. The sac, the size of a large grape fruit, was filled with cloudy fluid and intestines, in places covered with small flakes of whitish lymph, and adherent everywhere to each other and to the sac. The hernial ring was two and a half inches in diameter. With great difficulty the intestines were separated from the sac and returned to the abdomen. The terminal ileum which had been separated from its mesentery was sewed as described above. Hernia repaired by overlapping from above downward. Lipectomy.

The patient has remained well ever since.

220 WEST 98TH STREET.

## SKIN CANCERS.

In reviewing many histories of superficial cancer one is struck by the apparent sameness of the account given by the patient. An old lump, wart or mole may have existed for years and caused no trouble; a year ago, following possibly some irritation, it began to grow; six months ago it began to ulcerate, or possibly a slight discharge may have been observed; the usual ointments or ducting powders have been applied, but the irritation increases, or the ulceration becomes larger; the general health may be as good as usual, and very little or no inconvenience has yet been noted. But the patient is now getting uneasy and seeks advice in the matter. By this time it has ceased to be an early cancer. —CHRISTIAN LONGENECKER, in the *Pennsylvania Medical Journal.*

## CANCER OF THE CERVIX.

The importance of early diagnosis of cervical cancer is so urgent that, when called upon to treat a lesion of the cervix, carcinoma should always be thought of first and excluded from the diagnosis. The signs and symptoms of cancer of the cervix are so few that a hurried and superficial examination of any suspicious condition should never be made. If there is the slightest doubt, the diagnosis should be reserved and the patient kept under careful observation. Too often we are told by the patient that an examination had been made by her physician, but the condition was treated lightly and repeated examination was not insisted upon—E. A. WEISS, in the *Pennsylvania Medical Journal.*

# UTERUS UNICORNIS—A CASE REPORT.

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Kratzmeyer and Gilpi[1] found in 1,000 cases examined five of abnormal development of the sexual organs. These abnormalities are often associated with urinary or hindgut irregularities also.

Radish[2] has collected 255 cases of absence of the kidney, 100 of which showed defects in the genitalia; of these, 49 occurred in males.

Deformities of the female generative organs may be divided into three groups:

Fig. 1. Specimen of uterus unicornis with hematometra. The upper body is the uterus; the constriction is at the level of the internal os uteri. The lower body is the dilated cervix. The probe at the left is introduced into the single (left) uterine artery.

1. Absence—failure of the embryonic structures to develop at all.

2. Fusion abnormalities—failure to complete their development.

3. Reversion to an earlier type.

The internal genitals spring from two separate embryonic structures: the ovaries from the Wolffian bodies; and the tubes, uterus and vagina from the ducts of Mueller[3].

Although fusion of the two kidneys is a well-recognized abnormality, I have been unable to find in the material at my command any recorded instance of fusion of the ovaries. So congenital deformities of the ovary would seem to be more or less restricted to absence, incomplete descent or reversion to a lower type.

In tubo-uterine and vaginal malformations the field is broader owing to the fact that the partial fusion of paired tubes is necessary for their complete

development. Kerr[4] says that uterus bicornis is probably the most common form of fusion abnormality. As examples of these forms of congenital malformation are uterus bicornis, uterus bicornis unicornis, uterus septus, uterus subseptus vaginalis, uterus didelphys, uterus pseudo-didelphys.

Uterus unicornis, while it is a fusion abnormality, is characterized by the complete absence of one of the ducts of Mueller, its fellow carrying out its part of the program more or less completely.

Atresia is more difficult to explain, for we except these cases which are, or may be, due to intra-uterine or early extra-uterine inflammations, and the subsequent partial or complete obliteration of an already formed canal.

That such an inflammatory condition could have occurred in the case reported might possibly explain the vaginal condition only.

Edna C., white, American, aged 15 years, of healthy parentage, was seen by me first a few hours after birth, with Dr. Charles F. Ginn, who had made a diagnosis of atresia ani vaginalis. She was then operated upon successfully, and though no sphincter ani fibers were found, she has had little trouble with her artificial anus during these years owing largely to the fact that she has been constipated.

Childhood was uneventful until one year ago, when there developed pelvic and left-sided abdominal pain in four to six-week periods, unaccompanied by any menstrual flow.

The intense pain led to the discovery of a tense, globular, tender tumor in the left pelvis and reaching as high as the costal margin. A diagnosis of ovarian cyst was made.

At operation an unadherent, multilocular, left ovarian cyst was found and easily removed. No Fallopian tube and only a rudimentary broad ligament could be demonstrated on this side. The round ligament was normal. On the right side no trace of ovary tube, broad or round ligament was found. The uterus was normal in size so far as the fundus was concerned, but it merged into a small egg-shaped cystic swelling at its junction with the neck.

Closing the abdomen and examining the patient in the lithotomy position, I found the external genitals normal, the hymen present with large circular opening, a shallow depression just posterior and simulating the vagina, which proved to be the remnant of the ani vaginalis. There was complete vaginal atresia. Scissor dissection carried upward in the fibrous plane between rectum and vagina was unable to reach the cervical tumor.

Two weeks after returning home, she had the same type of menstrual pain as before operation. At the next proper period for menstruation pains became so severe as to require morphine; there was a continuous temperature of 101°, and a tumor was found as large as and in the same location as the former one. Associated with this were nausea, vomiting, and constipation.

Incision was made beside the left rectus scar of the previous operation. On walling off the intestines a large sausage-shaped tumor presented itself, starting from the median line at the level of internal os and curving toward the left until its fundus rested underneath the costal arch.

The small, globular cervical mass noted at the former operation had increased in size until it was 7.5 c.m. in diameter and 10 c.m. in length.

The contents of the hematometra was thick, tarry blood, 300 c.c. in amount, the last part being mixed with ropy mucus.

The peritoneum was stripped off the anterior and posterior surface of the uterus, beginning at the constricted portion between the neck and the body,

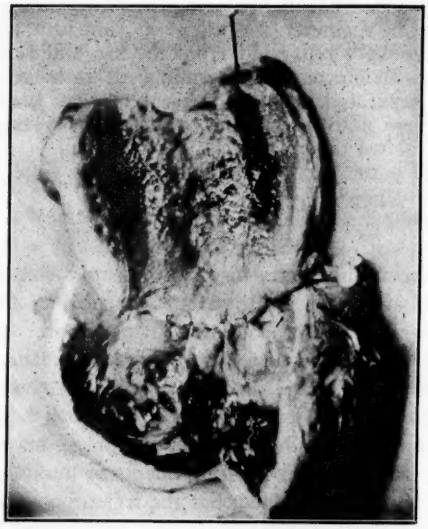

Fig. 2. Uterus unicornis opened on its anterior surface. The sutures are at the internal os; it was amputated at this portion to facilitate removal during operation.

having previously packed the cavity with gauze. The whole mass was enucleated with little active hemorrhage.

The anomalous condition of the blood supply was interesting. There was but one ovarian artery, the left, which was ligated at the first operation, and one uterine artery, the left. This artery, which sprang from the external iliac at its usual location, entered the uterus on its anterior surface almost in the median line between the bladder and uterus at the level of the internal os, and was as large as the radial artery in the adult.

Uterus unicornis is one of the rare types of uterine congenital malformations. The reported case evidently belongs to that type, inasmuch as there were but one round ligament and one uterine artery, and because of the embryonic position the uterus assumed when distended.

Hysterectomy offers the safest and surest means of relief in hematometra uterus unicornis associated with atresia vaginalis.

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## A CASE OF SARCOMA OF THE CONJUNCTIVA.*

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J. H., male, white, aged 60 years. The tumor was first noticed three years before coming under my observation, as a small mass located on the conjunctiva at the corneo-scleral junction to the nasal side. It had developed rather slowly, causing but little inconvenience other than bleeding, which was easily provoked.

At the time the patient came under my observation the neoplasm extended well forward between the lids and prevented their closing. The conjunctiva was markedly injected, and much pus was present in the conjunctival sac. The vision could not be taken, nor could it be determined whether other structures than the conjunctiva were involved, as the mass covered the cornea, although it seemed to have a relatively small base.

Immediate operation was advised, to which the patient consented. The neoplasm was readily dissected from the conjunctiva, and while the appearance and character of the growth, etc., led me to believe it was malignant, the precaution was taken to have a section examined while the patient was still under the influence of the anesthetic. Dr. J. D. Allen, of the Louisville Research Laboratory, kindly made the section, and pronounced the growth sarcoma. Enucleation of the eye was then performed.

*Laboratory findings:* Macroscopically, tumor about the size of a pecan, irregular in shape. Cross sections present a pale white glistening appearance. Microscopical sections show a pronounced proliferation of spindle large and small round cells, also quite a number of tumor giant cells. The stroma is rather scanty, composed of connective tissue, with some round cell infiltration. Mixed cell sarcoma.

The operation was performed September 14, 1912, and in a recent communication the family physician states there has been no evidence of a recurrence.

Parsons states that sarcoma of the conjunctiva occurs most commonly at the limbus as an epibulbar growth, and that the first case was reported by Baumgarten in 1852. Since then but eighty cases have been recorded. These tumors are usually pigmented.

It is further stated by Parsons, from whose book I shall quote freely, that pigmented connective tissue cells are sometimes found at the corneal margin, and are often the starting point of malignant growths. Such neoplasms are sarcomata, and must be distinguished from malignant tumors originating in congenital nevi which must now probably be regarded as carcinomata.

The tumors may appear as black, brown, or red, smooth, round elevations, or nodular masses. The corneal stroma is not usually invaded, or at most the superficial layers only. In Wadsworth and Verhoeff's case the anterior third was infiltrated, but the whole may be involved in the latter stages. Increase in growth takes place principally in the conjunctiva, so that the tumor can still be moved over the globe. Accounts show that these neoplasms develop slowly, requiring about a year to become the size of a pea or a bean. The patients are usually old, but Krautner, Benson, and Schultze report cases at 8, 11, and 14 years, respectively. The average age of the patient is 51 years.

The general opinion as to malignancy is voiced by Verhoeff and Loring, who regard such neoplasms as highly malignant, judging by their tendency to recur and form metastases. Of the thirty-six cases on which they report recurrences, metastasis occurred in eight, and recurrence in lids and orbit in four others. The consensus of opinion is that they are extremely malignant and should be treated by radical methods. (Primary enucleation.)

Microscopically, sarcomata of the limbus show few peculiarities. They are usually round or spindle celled, the cells being of various sizes in different cases, and generally arranged in bundles.

Penetration of the globe in these cases is extremely rare, although it does occur, according to Kerschbaumer; the growth then passes along, perforating the anterior ciliary vessel. The intraocular invasion is never extensive. Invasion of the cornea is always at first between Bowman's membrane and the epithelium.

Sarcoma involving other parts of the conjunctiva is very rare. One case has been published by Griffith in which the tumor occurred in the upper fornix; in another it arose at the inner angle in the socket of an enucleated eye.

*Clinical report before the Louisville Eye, Ear, Nose and Throat Society, May, 1915.

### CHOLECYSTITIS.

Non-calculous cholecystitis seems occasionally related to a diseased appendix or to inflamed hemorrhoids. As a considerable period of time may intervene between the original disease and the cholecystitis, the connection is not always determinable except at operation or at autopsy.—DAVID REISMAN in *The Therapeutic Gazette.*

# COMPLETE TORSION OF THE GREAT OMENTUM.

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The case herein recorded is the second instance of torsion of the great omentum on record in which the diagnosis was made before operation and thereupon proven; the first case correctly diagnosticated is credited to Rudolph of Prague.[1]

Torsion of the omentum, in spite of the number of cases that have been reported in recent years, is still an uncommon surgical condition. The first case was described by Oberst in 1882, the second by Demons, five years later. Bayer, Monod and Eiselsberg each recorded a case and with each year more cases were put on record until, in 1907, Lejars was able to tabulate 66 instances of this surgical curiosity, as it then was. In 1910 Balduin collected 78 cases from the literature, and in 1913 Armstrong[2] increased the number to 120, since which time Patel and Santy[3], Cinaglia[4], Fritsch[5], Lejars[6], Pentz[7], and Morestin[8] were each able to add one case to the rapidly growing list and Thevenard[9] mentions four cases, so these with the author's bring the list up to about 131.

This condition occurs in two types, acute and subacute. It has been subject to various attempts at anatomical classification by Corner and Pinches[10], Patel and Santy (*loc. cit.*). Payr (quoted by Mueller[11], after a study of the reported cases, suggests that torsion may be divided into the following:

1. Torsion without coexisting hernia: (a) simple cases involving the omentum only; (b) complicated cases involving other adherent abdominal organs.

2. Torsion with pre-existing hernia: (a) intraabdominal torsion without involvement of the hernia; (b) intraabdominal torsion with involvement of the hernia (strangulation or inflammation); (c) omental torsion within the hernial sac only; (d) complicated cases: 1, both intraabdominal and hernial twisting; 2, either intraabdominal or intra-hernial torsion associated with a retrograde incarceration.

This classification while seemingly cumbrous, covers every type of reported case. The type most common is the intraabdominal torsion with involvement of the associated hernia by either strangulation or secondary inflammation. Corner and Pinches found that 75 to 80 per cent. were of this variety and but 10 to 12 per cent. each of the hernial or abdominal type.

The mechanism involved in the production of this very unusual condition is but little understood except for the fact that in the preponderance of cases there is an associated hernia, either external or internal, or an adhesion to some structure whereby the omentum becomes fixed thereby acquiring a pivotal point. The omentum itself is but little changed pathologically except for a congestion of varying degree or an anemia that may go on to complete gangrene with perhaps an extraneous infection, usually hematogenous, in the long existing cases. In some of the long-standing cases the omentum was found to be completely gangrenous due to the complete cutting off of the blood supply from the twisting of the pedicle; just short of this, thrombosis of the vessels may occur with the liberation of emboli to lodge in the various organs, especially the lungs.

Of factors having an etiological bearing on this condition many have been enumerated, among which are: malignant and tuberculous implantations in one form or another which have acted by virtue of their added weight in bringing about and accentuating the torsion, appendicitis, pelvic inflammations, anomalous membranes and folds of peritoneum and, as previously mentioned, inflammatory adhesions and herniae.

As a natural result of the fact that herniae occur more frequently in males than in females, omental torsion has been found twice as often in the former as in the latter and usually between the ages of thirty and fifty. In a series of 24 cases Rudolph found 16 associated with a right inguinal hernia and 5 with a left; while Corner and Pinches in a series of 53 cases showed that of this number that were associated with a hernia there were 33 on the right side and 9 on the left. It thus will be seen that the existence of a hernia, usually for a number of years, has more than an incidental bearing in the production of this condition; in fact Lejars states that 90 per cent. of these cases have their rather common defect as the latent factor in bringing about the condition.

Given, then, an old hernia with a tab or a larger piece of omentum adherent to the interior of the sac or caught in its neck, one of the conditions found in the vast majority of the reported cases is fulfilled, namely, an abnormal fixed pivotal point usually at the periphery of its distal end. This is also exemplified by an adhesion to the parietes or some adjoining organ, thus creating a hammock-like arrangement, the upper end fixed by the normal attachments of the omentum and the lower by this abnormal restraining area. Having established this latent factor, there is only lacking the

impulse, whatever it may be, to start this hammock swinging and precipitate a crisis.

It has been shown by Rubin[12] that the omentum is devoid of independent motion and that its seeming ubiquity is dependent upon intestinal peristalsis, intraabdominal tension, static conditions of the stomach, colon and small intestine and the anatomical relation of the omentum to the gall-bladder and spleen; and as these factors are normally inconstant, the actual impetus that brings about the beginning rotation will still remain in doubt.

The actual state of affairs may be likened to that of a flag swinging from a pole in the breeze, its lower end caught on an adjacent nail or twig. A hammock-like arrangement is thus produced and with the wind continuing interruptedly, the flag wraps about itself, so to speak, and a tightly twisted mass is the result—a rotation of the central portion and turns in opposite directions at the poles. While normally the omentum is idly moved about by the factors mentioned above, when a fixed pivotal point is introduced and the motion is kept up, the hammock-like arrangement is accomplished with the possibility of a resultant torsion. As has been previously stated, the actual impetus to bring this about will remain in doubt, as an enormous number of our abdominal cases operated upon for entirely alien symptoms and conditions, have herniae and adhesions present undoubtedly for a number of years without omental torsion. So with the small number of cases reported, the actual torsion must be looked upon as an idiopathic accident.

*Symptoms*—The active symptoms occur only when there is interference with the blood supply.

In the acute type at the onset there usually occurs some degree of pain, continuous in character, but this may be cramp-like if there is an associated ileus. Over the lower abdomen the muscle spasm is invariably distinct and later, with the edema due to the venous obstruction and the torsion, a mass may be mapped out with poorly defined margins and dull on percussion. Vomiting, rarely blood-stained, occurs in about half of the cases. Obstipation is also seen in about half of the cases, but where the twisted upper pole encroaches on the transverse colon, mechanical obstruction may occur to a more or less degree or there may be blood and mucus in the stools from the stasis, as in our case. Ascites is rarely present.

In the cases where the torsion is in a hernial sac alone, the symptoms of a strangulated hernia supervene; in fact all the symptoms are present except the continuous vomiting with its gradual transition to an enteric character and the attendant change in the pulse and general condition of the patient. These cases are no doubt more common than is supposed but are treated as simple incarcerated omentoceles.

In the cases of the intraabdominal variety with involvement of the associated hernia, occasionally all the symptoms stated above are present in addition to the abdominal tenderness, muscle spasm or rigidity. Corner and Pinches found that in one series 14 had pain in the hernia only, 17 referred their pain to the abdomen, 7 had pain in both localities, 11 in the right iliac fossa and 1 in the region of McBurney's point. In the cases giving a clear history, the diagnosis of this type ought to be made more frequently and no doubt will be as soon as the connection between the hernial and abdominal lesions is better understood.

In the purely abdominal cases the diagnosis is of course nearly impossible, for with or without the scar of a previous operation and the onset of an acute abdominal crisis, the diagnosis of an incomplete intestinal obstruction due to adhesions is most apt to be made, if any definite one is made at all.

In the subacute type, the symptoms are of a milder degree and longer duration than those of the acute type. The most prominent symptom is pain, either in the region of the upper pole as in our case, or in the hernial sac if one is present or at the site of the lower pivotal point. Vomiting may be present and there may be some signs of obstruction of the bowel, but these symptoms do not persist for any length of time, although recurrences are very common.

Mrs. A. J., No. 48,853, age 49, was admitted to Lebanon Hospital in the service of Dr. Parker Syms on January 31, 1915, with the following history: Has had a right inguinal hernia for 21 years which has gradually increased in size. Has worn a truss for the past two years. During the last four months the patient has had indefinite pains, sharp and cramp-like in character, in the left lumbar region and to a lessor degree in the right groin and in the hernia itself. These pains would persist for a few days and then disappear, to recur in a week or two, and have gradually become worse during the last four or five weeks. Her present illness dates back four or five days before admission when she was seized with these pains in the back, groin and hernia; her discomfort then continued without cessation up to the time of her admission. She did not vomit but felt nauseated when the pains were most severe. Appetite poor and bowels regular for the first two days of her illness, but on the second day the patient noticed a mucous stool mixed with blood; another movement of a similar character was observed on the day of admission. Has had "fever" and chilly sensations for the last day or two. Lately she has

had to get up four or five times a night to urinate. Temperature 102°; pulse 120; respirations 30.

*Physical Examination*—Head, neck and chest, negative. Abdomen symmetrically distended. Moderate-sized inguinal hernia present on the right side which is irreducible and very tender. Abdomen markedly tympanitic. Acute sensitiveness over the entire abdomen, with special points of tenderness under the left costal margin and also in the right lower quadrant; in this last area there is considerable muscular spasm and rigidity and the distinct outlines of a large mass, ovoid in shape, the upper pole fading gradually to the left and the lower seemingly merging into the inguinal canal. Diagnosis made of torsion of the omentum.

*Operation*—Right lower rectus incision. Considerable sero-sanguinous fluid escaped when the peritoneum was opened. Omentum found, very dark in color and its lower end wedged in the right internal inguinal ring, from which, after considerable manipulation, it was extracted; this portion thus liberated was almost black and about to slough. The upper part of the omentum was then inspected and close to the splenic flexure of the colon it was found to be twisted into a tight cord, about two inches in diameter. Untwisting this, it was found to have rotated almost twice. This pedicle was transfixed and tied off and the omentum was removed. The sac of the hernia was adherent to the surrounding structures and it was not possible to invert it into the abdomen for removal. As the patient was somewhat shocked, the internal ring was closed with several Pagenstecher sutures of linen, care being taken to avoid the deep epigastric vessels. The abdomen was closed in layers without drainage.

The temperature fell to normal soon after operation and with the exception of a slight phlebitis in a varicose vein in her left leg, the patient made an uneventful recovery and was discharged cured on February 14, 1915.

The specimen showed a greatly congested omentum in its entirety with a number of thrombosed veins and a beginning necrosis at its lower pole (the part that was in the sac) and at its upper extremity were a number of bands of scar tissue, presumably due to old twists that fashioned this portion into a stout cylinder. There are some good illustrations of this condition in Keen's Surgery Vol. VI, pages 515 and 564.

The case at first presented considerable difficulty in trying to correlate all the physical signs, but the history of a troublesome hernia coupled with the mass above this irreducible rupture and the acute tenderness in the region of the splenic flexure, after some consideration explained themselves in this wise: the lower pole of the omentum was caught in the hernial sac, which acted as its lower pivotal point, while the tenderness beneath the left costal margin arose from the upper pole where it had reciprocally twisted. It is only fair to state that I had the good fortune to recall a case that had been shown at the New York Surgical Society by Dr. Syms in April, 1911[13], which, although it was totally dissimilar in many respects, being complicated by an acute suppurative pancreatitis and intestinal obstruction.

The second area of tenderness under the left costal margin, as was present in our case, seems to have been overlooked or was not complained of by the patients in the majority of the articles dealing with this subject, but as the omentum *must* have an upper reciprocal pivotal point in *all* cases it is rather surprising that it is so scantily dealt with; Armstrong, however, states that in his case there was tenderness under the right costal margin. Connecting the troublesome hernia below and the other site of pain in the left lumbar region above the structures to be thought of would be either the omentum or the intestines, but as there were no signs of obstruction and a distinct mass was felt, the omentum seemed to be the logical link.

The old bands of scar tissue in the region of the upper pole showed that with the pain the patient had had in the past, and probably the cause of it, was a slight torsion of the omentum that relieved itself and caused symptoms of the subacute type at these times.

The history of having passed blood and mucus twice was explained by the fact that where the upper pole of the omentum was twisted close to the splenic flexure of the colon there was considerable congestion of this portion of the bowel which caused some "weeping" of blood into its lumen and its appearance in the stool with mucus.

*Treatment*—The only treatment of this condition is operative. The usual procedure when the case is associated with a hernia has been to make the primary incision over the hernia directly and, with the recognition of the exact state of affairs, to trace the omentum upward if the ring is large enough or to make use of a second incision through the abdominal wall for further inspection and manipulation; but if the diagnosis is presumed at or made definitely the primary abdominal incision is best as it brings one down to the site of the trouble at once. In some of the cases the torsion was relieved and the omentum replaced without removal, but this is of course only applicable to the cases that come to operation early. From what we know of the fate of placing parasitic omental grafts and their questionable value it seems to us that it is wiser in even a doubtful case to ablate the omentum above the twisted upper pole to obviate the pos-

sibility of the omentum sloughing as a whole or in part and to prevent a likely recurrent torsion at a later period. Unless there is distinct gangrene the abdomen may be closed without drainage in the uncomplicated cases. In passing, it is interesting to note that Morestin in his case made use of ether lavage before closing the abdomen.

Should the hernia not be attacked directly, the sac may be inverted and tied off from within the abdomen and failing in this the ring may be closed with non-absorbable sutures from the interior as we did in this case and have done in others of a different nature.[14] Should any trouble arise from the empty sac, a simple incision under local anesthesia may be made and suture of the sac to the skin and packing, as in a Volkmann operation for hydrocele. If the hernia persists, a radical operation may be done at a later date or, what is better still, if the patient is not jeopardized this may be done at once.

*Prognosis*—Nearly all of the uncomplicated cases have recovered, the mortality being in the neglected or long-standing ones that have come to operation very late and have had other conditions added to the original one. According to Van Hook and Kanavel[15] the mortality is about 90 per cent., while Mueller places it at about 84 per cent., but as the condition is better understood and recognized the mortality should be no higher than any other acute abdominal torsion that is recognized early and submitted to operation. In the cases associated with a hernia which shows symptoms of incarceration, the prognosis is somewhat better as these cases are usually viewed, at least tentatively, as hernial crises and subjected to early operation at which time the real condition was recognized and treated accordingly.

In the purely abdominal cases where an adhesion or an internal hernia is the exciting cause or in the "idiopathic" cases, the diagnosis is less apt to be made, especially as the obstructive symptoms are the exception rather than the rule; the cases may remain under observation while the omentum goes on to gangrene, with perhaps an hematogenous infection added to further sap the patient's vitality and so intensify the operative risk.

473 EAST 141ST STREET.

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## CONGENITAL ABSENCE OF LEFT OVARY AND FALLOPIAN TUBE, REPORT OF A CASE, WITH A SURVEY OF THE LITERATURE.

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The following inquiry into the literature concerning congenital imperfections of certain portions of the internal generative organs, has as its principal *raison d'être* a recent personal observation in which such an anomaly was unexpectedly disclosed by exploratory celiotomy.

Partial or complete congenital absence of the internal generative organs, with or without accompanying anatomic imperfection or developmental error of the external genitalia, must occur with greater frequency than surgeons and anatomists have appeared to generally believe, as shown by the multiplicity of such examples recorded in ancient and modern literature. Upon the basis of present anatomic and embryologic understanding, it is difficult to appreciate why one portion of the genitalia should develop normally, whereas another may be either congenitally absent or exhibit marked evidence of anatomic imperfection, inasmuch as the entire reproductive system has a common origin, viz., the Wolffian and Müllerian ducts. Strange as the observation may appear, however, a female may possess normal ovaries, and be minus Fallopian tubes, uterus and vagina; on the contrary, she may possess one or all the latter without the former.

The various congenital generative anomalies, in the order of their frequency, may be approximately stated as follows:

(1) VAGINA:
- (a) atresia,
- (b) absentia,
- (c) duplex and septate,
- (d) rudimentary,
- (e) rectal, perineal and abdominal ostia.

(2) UTERUS:
- (a) atresia (cervical),
- (b) absentia,
- (c) duplex and septate,

(d) rudimentary,
(e) cervical duplication and bifurcation.

(3) Ovaries:
(a) unilateral or bilateral absentia,
(b) unilateral or bilateral displacement,
(c) unilateral or bilateral atrophy.

(4) Oviducts:
(a) unilateral or bilateral atresia,
(b) unilateral or bilateral distal displacement,
(c) unilateral or bilateral ostial duplication.

Since the scope of this dissertation must be limited to congenital tubal and ovarian anomalies, further consideration cannot be accorded other developmental defects, although the general subject of congenital generative imperfections possesses absorbing interest. To ascertain the essential causative factors which may be concerned in the production of congenital errors of development in any anatomical situation would require careful investigation of the more profound physiological problems, even including study of the intricacies of embryogenesis and organo-genesis, which cannot be legitimately included herein. However, the brief statement may be permitted that, in so far as congenital anomalies of the genitalia are concerned, the most reasonable explanation for their existence may be found in accidental inclusions and inherent imperfections of the original ducts from which these structures are derived.

Congenital absence of one or both ovaries has been frequently observed. Hunter, Vidal, Chaussier and many others record typical instances in which both ovaries were absent, and at one time Thudicum collected twenty-one examples of this nature; observations published by Cripps, Pears, Morgagni, et al., indicate that they have also noted instances of total ovarian absentia. Cripps' patient was a girl of eighteen with infantile uterus and no ovaries; she had neither menstruated nor exhibited signs of puberty. Lauth and Ruband each cite cases in which the ovaries were rudimentary. Congenital absence of both ovaries associated with other anatomic defects have been noted by Ferguson, Spruill, Stewart, Garcin, Todd, Frank, McCann, Ramage, Ladinski, Wright, Withrow, Tuttle, Faidherbe, Dorland, and many other observers.

I wish to express disagreement with those who claim that "when both ovaries are absent there is lack of development of the mammæ and other sexual organs"; and also that "when one ovary only is absent the corresponding side of the uterus is poorly developed!" There would appear no tenable physiologic reason why absence of one ovary should cause limitation of uterine development, nor is the procreative capacity of the individual thereby impaired. In thousands of instances one ovary and the corresponding tube have been surgically extirpated for relief of unilateral pelvic pathology, without interfering with future child-bearing function; moreover, as in the case to be cited in detail, one ovary and one tube may be congenitally absent without disturbance of anatomic development, menstrual function, or procreative ability. The assumption that abnormality of the external genitalia also implies imperfection of the internal organs, is also not in accord with the facts. Hundreds of instances or absentia or tresia vaginæ have been recorded where the uterus, Fallopian tubes and the ovaries were normally developed, and the converse is equally true.

It is the belief of certain observers that absence of the ovary is due to abnormal attachments of adjacent structures in consequence of which development of the ovarian *anlage* is arrested and atrophy follows. Obviously, however, this represents an "explanation which fails to adequately explain," since it contains no suggestion as to why in one instance there should occur abnormal attachments with consequent obliteration of the ovarian anlage, whereas in a million others the causative factors which are presumed to produce such phenomena remain inoperative. Furthermore, not infrequently normally situated ovaries are persistently rudimentary, their egg-producing function being imperfectly established, or never assumed. The occasional occurrence of unilateral or even bilateral ovarian duplication is said to originate from constriction or isolation of certain portions of the primary anlage, and a strange feature in such instances is that each supernumerary ovary thus produced may possess a normal oviduct and ligamentum proprium!

Although not strictly pertinent to the subject the observation may be interesting that, in those not infrequent instances where menstruation, ovulation and pregnancy occur following the surgical extirpation of both ovaries and both Fallopian tubes, the explanation may invariably be found in the presence of supernumerary ovaries and oviducts. While the possible existence of supernumerary ovaries and tubes was vigorously disputed by certain of the older authors, the painstaking researches of Biegel, Puech, Thudicum, Winckel, DeSinety, Paladino and many more recent observers, have incontestably established the fact that such anomalies do occasionally occur. In addition thereto the clinical observations already mentioned—

menstruation, ovulation and pregnancy following bilateral salpingo-öophorectomy, furnishes evidence which no one can reasonably hope to successfully refute. Sippel records an instance of third ovary; Mangiagalli found a supernumerary ovary in the body of a stillborn child, situated to the inner side of the normal organ; Winckel discovered a large supernumerary ovary connected to the uterus by its own ovarian ligament; Klebs found two ovaries on one side, connected by a band three-fifths of an inch long; similar examples are cited by Doran and many others. Incidentally, perplexing medico-legal questions have arisen where women have borne children after the surgeon stated he had totally removed both tubes and ovaries and in consequence that future pregnancy would be impossible; but further consideration of that phase of the subject would be inappropriate herein.

One or both ovaries may be congenitally displaced in such degree that even should ovulation occur, the ova would necessarily fail to reach the tubal ostia; thus the woman would be rendered practically sterile, although potentially fertile. The ovaries may occupy the cul de sac of Douglas, the vaginal wall, the inguinal regions, the labia majora, the rectum, etc. Munde, Barnes, Lentz, Madden, Smith and a host of others describe such instances. Cloquet mentions a case in which the ovary, tube and uterus were found in the inguinal canal; Peuch collected nearly one-hundred instances of inguinal ovarian hernia, and about twenty of the crural type. One example of bilateral crural ovarian hernia is cited by Otte. Tedford refers to a curious instance in which the ovary became separated from its normal attachments; after the patient had suffered for a considerable period from intestinal invagination and inflammation of the ovarian tissue, the ovary was discharged through an opening into the sigmoid and thence expelled from the anus.

Even when apparently normal in development and anatomic situation, the ovaries may later become atrophic and consequently functionless from interference with innervation or obliteration of the blood supply.

According to available literature, congenital anomalies of the ducti Fallopii are of rather infrequent occurrence. As in case of the ovaries, I wish to oppose current opinion with respect to the presumed relationship between tubal absence or imperfection and other congenital generative developmental errors, i. e., that other anomalies should be invariably expected where the oviducts are absent or mal-formed. The statement lacks definite confirmation that grave malformations of other portions of the generative tract are associated with tubal absentia. As illustrated by the example to be reported herein, there may be congenital absence of one tube and ovary without other generative imperfection; and normal oviducts may likewise exist where the ovaries, uteri and vaginæ are defective.

As a result of local arrest in tubal development there may occur atresia or stenosis in any portion of the tubal lumen; sometimes the caliber is markedly increased; one tube may be longer than the other; there may be several fimbriated abdominal ostia. Ferraresi, for instance, observed in one tube six openings surrounded by distinct fimbriæ. Supernumerary tubes with and without corresponding ovaries have been observed; these may originate in cystic diverticula, or in the mesosalpinx as independent tubes with normal fimbiæ.

One or both Fallopian tubes may be partially or completely absent without other genital malformation. Blasius reports an instance of deficient oviducts; Blot cites a case where one ovary was atrophic or rudimentary, with absence of the corresponding tube. Doran speaks of multiple Fallopian tubes, and several varieties were noted by Richard; such tubes are sometimes fused or adherent to the uterus or ovary. Fabricius describes a case in which one tube opened into the rectum. Lejars mentions an instance of congenital atresia of the left tube, and one of bilateral tubal atresia is recorded by Doleris.

Purcell performed necropsy upon a woman who died in the ninth month of pregnancy, finding on one side a uterus of ordinary size and shape for that period of gestation and containing a fully developed fetus, with one ovary and a single Fallopian tube. Upon the other side there was a second uterus, unimpregnated and of normal size, to which another tube and ovary were attached. These uteri were distinct and almost entirely separate.

Goldspohn operated by celiotomy upon a married woman with large pendulous abdomen, who had suffered for a considerable period with abdominal pain and other symptoms presumably due to salpingitis or appendicitis. A diseased appendix was found, but there were no internal generative organs. There were the rectum and bladder as in the male, but nothing beyond that. Her external feminine characteristics appeared normal.

Barrett refers to a female of eighteen who had never menstruated; she had been married two weeks, but sexual intercourse was found impossible on account of there being no vagina. Examination also revealed absence of the internal generative

organs. Another young woman (Byford) had normal external but no internal generative organs; she had perfect mammæ, good form, enjoyed normal health, and later married.

Todd cites the case of a female of twenty-four, a perfect specimen of physician womanhood from external appearances, who had never menstruated. Examination revealed no hymen, and the ostium vaginæ appeared less elastic than normal; the supposed vagina was two and a half inches deep and terminated abruptly. Further investigation disclosed absence of the uterus, tubes and ovaries.

Garcin saw a married woman of twenty, nullipara, who had never menstruated, nor had there been any vicarious hemorrhage. Vagina, uterus and ovaries absent. The undilated urethra would admit the thumb and index finger, and it was through this coitus had been practiced.

Sloan performed necropsy upon a woman of twenty-four. Externally the body presented nothing worthy of note, excepting immaturely developed mammæ with absence of nipples, although the areolæ were well-marked; mons veneris totally devoid of hair. Uterus, tubes and ovaries absent; ostium vaginæ normal, the internal extremity terminating in posterior cul de sac of Douglas. The cavities which the uterus, tubes and ovaries should have occupied were occluded.

James reports congenital absence of the uterus, ovaries and clitoris in a well-developed mulattress of twenty. The external genitals appeared normal; mammæ well-developed. Examination under anesthesia disclosed neither uterus nor ovaries; vagina represented by shallow pocket with meatus urinarius near center; the lesser labia appeared normal; clitoris absent.

Stewart (*Medical Sentinel*) mentions a married woman of twenty-eight with masculine mammæ and hips; vulva and clitoris normal, hymen absent; fourchette well-developed; a cul de sac 2. 8 c. m. deep "apparently formed by continued assaults of the male organ" in location of vaginal os. Absence of uterus, tubes and ovaries demonstrated by examination under anesthesia. A nodule about 2 c. m. in diameter between rectum and bladder represented termination of genital cord.

Spruill refers to a robust German woman of twenty-two, large and well-formed, who had never menstruated. Appearance of external genitals normal; vagina represented by cul de sac one inch deep. Examination revealed absence of uterus and ovaries.

The following personally observed case differs in several essential respects from many of those recorded in the literature:

An exploratory celiotomy was recently performed upon a woman of twenty-four who presented decided indications of right tubal disease, or possibly a chronic appendicitis. Abdominal incision disclosed evidence of existing chronic appendicitis, and also a cystic right ovary. After examining the right ovary and deciding that it should be extirpated—as it is my custom to always examine both tubes and ovaries before removing either—I proceeded to investigate the left side, and to my astonishment the left ovary could not be found. After carefully exposing the left side, a stump of the tube about an inch and a half in length was found, the remainder evidently being congenitally absent. There simply remained this tubal stump with no vestige of the ovary.

The outer extremity of the tubal stump was completely closed in an oblique manner. The corresponding uterine cornu was normal, as was also the remains of the tube which had the usual attachment to the broad ligament. The round ligament was normal and could be traced the customary distance across the pelvis.

The patient was the mother of one child, and had menstruated normally since she was fourteen. She had not previously been subjected to any surgical operation.

A conservative operation was peformed upon the right ovary, which was enlarged to three times its normal size, about two-thirds of it being extirpated. I did not feel justified in removing the entire right ovary, as the left was absent. The appendix was also removed.

The patient made an uneventful recovery, and has remained perfectly well.

The anomaly encountered in this case was a great surprise to me, and had it not been feasible to positively demonstrate the condition, possibly I might have overlooked the fact that the left ovary was absent.

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## A GLIMPSE INTO PRESENT-DAY MILITARY SURGERY.

### A Letter from the Late ERNEST P. MAGRUDER, M.D., F.A.C.S., of WASHINGTON, D. C.

[Dr. Ernest P. Magruder, a talented surgeon of Washington, D. C., Professor of Clinical Surgery, Georgetown University School of Medicine, was one of the many American surgeons who volunteered for Red Cross service in Europe last fall, and one of the all-too-many American physicians whose lives have been sacrificed by the scourge of Serbia-typhus fever. He died in Belgrade in April.

The following letter, furnished to the JOURNAL by his brother, was written by Dr. Magruder in Gevgelija, Ser-

bia, the "pest-hole of Europe," three days before he acquired his fatal infection. We believe that the posthumous publication of this epistle will interest our readers no less by its informative qualities than by its sentimental association, for it is a vivid pen-picture—sharply drawn in vigorous English phrases—of the horrors and sufferings of war, of the prodigious efforts and self-denying sacrifices of those who seek only to alleviate these sufferings!—Ed.]

Gevgelija, Serbia,

Dear ————: March 23, 1915.

I have wished to write to you ever since we got started here, but the work has been so heavy altogether—converting buildings into hospitals, organization of the whole plant, sanitation, care of the wounded and sick (we began with thirteen hundred patients, mostly surgical)—that when night came one could only topple into bed and hope that the work of the morrow would be less exhausting.

Until lately, when the medical cases exceed the surgical, we had, among other things, an endless variety of compound fractures, gun-shot wounds of the skull, chest, abdomen, arms and forearms, thighs, legs and feet; amputations, single and double; aneurisms, of the common carotid, subclavian, axillary, brachial and femoral arteries; fecal fistulae; the extraction of the greatest variety of shot and shell, huge bullets, shrapnel, grenade and dum-dum; and one hernia of the brain of great interest to me. On the whole, the work has been wonderfully interesting.

This great war is quite educational in its influence upon medical science, because of the new and special nature of its aspects, especially with reference to shell fire. Formerly the surgeon had to treat wounds caused for the most part by rifle bullets. Today his special attention is called to the frightful casualties of grenade and shrapnel. The dynamite grenade was first used at the siege of Mafeking. In the Russo-Japanese War, the Japs used this modern high explosive very effectively. It is cylindrical in form, filled with shimose powder and fitted with a time fuse and percussion cap. It bursts into many fragments and emits a gas which is very painful to the eyes and air passages.

The shrapnel is a projectile fired from a gun and carrying a large number of bullets. At the point of bursting the bullets are charged with an added energy over a wide area. It is the main reliance in the present war's field artillery. It is most effective against large bodies of troops in masses, in mountain and siege artillery, as well as in repelling attacks against sea coast fortifications. Its casing is a steel tube with a solid base. The 3-inch field gun shrapnel weighs 15 pounds, its length is 10 inches and its muzzle velocity 1700 foot seconds. It contains 252 round bullets made of hardened lead. It is referred to as a man killer at 6500 yards. But it has even then on bursting a remaining velocity to the bullets of 865 foot seconds. The fuse is gauged to make the projectile explode at the fractional part of a second in its flight. The preponderance, therefore, of artillery in the present war is a new order of things from the viewpoint of the modern surgeon.

Additional interest centers in the complications of those exposed to the terrifying effects of the high bursting charge of shrapnel, to aerial arrows and to the various types of flying machines. The new genius of man at war has been challenged by the old maxim, "familiarity breeds contempt," and he has accepted the challenge, knowing full well that man's nervous system is found at last not made of adamant, that there is an end to nerve power, nerve endurance. Truly, nerve-racking as well as death-dealing mechanisms have been the greatest study of the day. Nerve tension, from waiting for and dreading an attack, extreme excitement and mental confusion, aggravated by fatigue of mind and body and the ever-present menace of exhaustion—these have been calculated by man with mathematical precision and embodied in machines of death turned loose from hell to execute his purposes. Hence the moral and mental nervous wrecks we meet and those suffering functional effects from the near-by explosion of a large shell, as seen in the temporary loss of speech and hearing. Added to these are the terribly mutilating wounds of flesh and bone further complicated by infection.

These shrapnel wounds also give rise to the most virulent forms of sepsis. The present day rifle bullet travels so fast that it is often sterilized by the heat generated by the friction caused by the velocity of its flight. A wound by such a bullet, if it carry in no clothing or other septic matter, may heal promptly; whereas, the bullets carried within the shell of shrapnel frequently give rise to a most virulent form of infection, known as "spreading gangrene." This requires quick amputation of the member, and isolation to prevent its spread to other wounded soldiers in the ward. Modern treatment is powerless to control this form of blood poisoning in a badly infected case and I am now testing some of the latest discoveries in antiseptics in the hope of finding an effective remedy against this old scourge of war which the immortal Lister buried and which the modern shrapnel, curiously enough, has brought back to life.

I have only time to mention a number of cases of frostbite requiring amputation of one or both feet, sometimes of one or of both legs; several cases of lock-jaw; and a large hernia of the brain, following a compound shrapnel wound of the skull. The recovery of this patient, following operation, has been to me perhaps the most interesting and gratifying of all my cases.

There are many things of which I should like to write, but the censorship here in the war zone, of course, prevents.

Normally the town has about 7,000 inhabitants. It is a part of old Macedonia, held by the Turks for 500 years, and won by Serbia in the late Balkan War. The surroundings are beautiful, especially as one views the rising sun reflected from the snow-capped mountain tops. Saloniki (old Thessalonica, Greece, upon the Aegean Sea) is only four hours' run by train. So that we do not feel cut off entirely from the outside world.

On the whole, the work of the mission has been very hard, but the consciousness of the relief it has given to awful suffering in its manifold manifestations, has greatly lightened our labors. * * *

Faithfully yours, ERNEST P. MAGRUDER.

**American Journal of Surgery**
PUBLISHED BY THE
**SURGERY PUBLISHING CO.**
J. MacDONALD, Jr., M. D., President and Treasurer
92 William St., N. Y., U. S. A.
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**WALTER M. BRICKNER, M.D., Editor**

NEW YORK, AUGUST, 1915.

## PYELOGRAPHY.

To cystoscopy and to radiography more than to any other recent invention or discovery we owe the development of urologic diagnostics and the establishment of modern urology. The inevitable combination of these two procedures in pyelography represents a unique and interesting phase in that development and adds another to the many valuable resources with which the urologist's diagnostic equipment has been steadily expanding.

Introduced by Voelcker and von Lichtenberg in 1906, pyelography attracted but little attention for some time and it is only in the last five years that it has been seriously and generally studied. To Braasch, of the Mayo Clinic, a pioneer in this field, belongs the credit for the most extensive and consistent of these studies. His recently published monograph,* based upon several thousand pyelograms, is therefore interesting as an authoritative exposition of the possibilities and the present limitations of this diagnostic aid, the value of which in various conditions he had insisted upon in earlier writings.

Like many other diagnostic and therapeutic procedures pyelography was soon found to possess possibilities for mischief. In several cases the kidney was found infarcted or infiltrated by the colloidal silver (collargal). Less dangerous substitutes then were tried—argyrol 40%, suggested by Keyes, silver oxid and silver iodid, as suggested by Uhle and Pfahler, nargol, xeroform and, most recently, thorium nitrate and sodium citrate in neutral solution, recommended by J. E. Burns in the *J. A. M. A.*, June 26, 1915. While argyrol and other substitutes for collargol are less injurious to the kidney substance, Braasch and others believe that damage to the kidney will not occur if undue pressure is avoided. He therefore employs the gravity method of introduction instead of the hand syringe, and avoids the production of pain, which by many is sought as an indication that the kidney pelvis is suitably filled.

Obviously, there are certain conditions which a pyelogram or, more properly, pyelo-ureterogram, can at once clearly demonstrate or exclude, e. g., a stricture kink or dilatation of the ureter, a marked hydronephrosis, a gross deformity in the outline or position of ureter or pelvis, the evident location of a supposed stone outside of the urinary tract or its probable location in the ureter or pelvis, etc. Beyond these gross evidences, which anyone at all familiar with roentgenograms would recognize, the inexpert must proceed with caution. It is interesting to observe in Braasch's pictures the many varieties in which the shadows of normal kidney pelves may appear and the apparent similarity that some of these bear to the shadows of slight or moderate hydronephrosis. As with other roentgenographic interpretations, the finer diagnostic readings can come only from those of much experience, but this experience it is worth the urologist's time to acquire. By it Braasch has learned to distinguish inflammatory from mechanical dilatation of the pelvis, to recognize, in many cases, the presence of tuberculosis of the kidney, renal tumor, etc.

As with interpretations of roentgenograms of the alimentary tract, so with pyelograms, even the experienced eye may sometimes be deceived and one must not be too insistent on the significance of minor variations in outline. To take a gross finding as example, the apparent disappearance of a supposed stone shadow within the shadow of the subsequently injected kidney pelvis is only presumptive that the lesion is a stone. It is not by any means proof beyond a reasonable doubt. The apparent position of a shadow-forming substance within the substance of the kidney, as seen stereoradiographically, seems fairly convincing ocular proof of a renal stone; yet even here, occasionally, the kidney may be found quite normal. To cite a unique instance as evidence that all the diagnostic aids may some times fail where they seem most certain: Seelig recorded (*Ann. of Surgery*, Vol.

*Pyelography (pyelo-ureterography). By Wm. F. Braasch, M.D. W. B. Saunders Co., 1915.

48, p. 388) the case of a woman who had repeated attacks of severe pain radiating from the right loin towards the bladder, with marked hematuria. No tubercle bacilli. Five roentgenograms showed a clear-cut shadow in the path of the intrapelvic portion of the right ureter. A ureter catheter was blocked on the right side about two inches above the bladder; "even a stylet-armed catheter could not be forced by the obstruction," and the attempt was followed by severe pain. At operation the right ureter was exposed extraperitoneally throughout its entire length, but no stone was found in it. At the site where the stone was expected the "ureter was kinked as if pulled upward and inward" and a hard nodule was felt resting upon it. The peritoneum was there opened, and the appendix, containing a few drops of pus and a stony-hard concretion formed about a small seed, was found adherent to the ureter! Surely in that case every clinical symptom and physical finding pointed definitely to a ureteral calculus, and there is little doubt that a ureterogram, too, would have shown the shadow of the stone in the line of the shadow of the ureter.

We mention these possibilities of error not to discourage enthusiasm in pyelography but, quite the contrary, to urge its frequent employment, for only thus can the surgeon learn to recognize peculiarities in the shadows and to interpret them. In many cases pyelography is of very great assistance to accurate diagnosis, in some cases it is quite indipensable.—W. M. B.

## BOILING WATER INJECTIONS IN THE TREATMENT OF CAVERNOUS ANGIOMATA.

The management of large cavernous angiomata has always been a serious and often a quite baffling surgical problem. Ligation, even piecemeal, is not applicable, as in smaller vascular tumors; the attempt at destruction by electricity is a tedious and painful course, often vastly disappointing; ignipuncture, likewise tedious and productive of sloughing, is unacceptable if the neoplasm is extensive in depth or surface; chemical injections cause sloughing, often infection and, if safe, affect too limited areas, while extirpation with the knife is quite forbidden, not only by the great technical difficulties inherent, but also because it would involve the too extensive removal of irreplaceable tissue. This is especially true of the cavernous angiomata found on the face and neck of the new-born. These often involve the entire thickness of the cheek, and sometimes the tongue. In bad cases they may extend from the lip or eyelid to the ear, from the scalp to the clavicle. They have, too, a tendency to grow steadily in size.

Formidable as is the problem presented by such congenital vascular growths, they cry out loudly for treatment. By their very ugliness they interfere with the enjoyment of life, the continuance of which they threaten by the always imminent danger of sloughing and infection and, especially, of violent hemorrhage.

Since the ordinary methods of treatment applicable to capillary and to small cavernous angiomata are insufficient or dangerous when applied to large growths under consideration, it is gratifying to note in current literature that very satisfactory results have been achieved by the simple method introduced by John Wyeth of New York, viz., the injection of boiling water. Thus, J. Shelton Horsley in his interesting manual on Surgery of the Bloodvessels, just published,* records that he "has used this method successfully in several angiomas of the face and in a large angioma of the umbilical region," and Francis Reder of St. Louis reports in *Surgery, Gynecology and Obstetrics,* July, 1915, its employment in 26 cases with very gratifying results in all.

With reasonable precautions, easy of application, the method seems to be entirely safe, even when large amounts of the boiling water are injected. Reder records the injection, in one case, of six ounces at a single sitting. As much as three or four ounces, he says, may be injected at a sitting in a tumor the size of a hen's egg, about ten minutes being consumed in making the injection. The heat of the fluid and of the needle makes the introduction of infection very unlikely, even if the skin is not disinfected which, however, it should be. The boiling water causes an immediate coagulation of the blood and of the albuminoids of the connective tissue and blood vessels, and destroys the endothelium of the blood spaces. It may, with apparent safety, be injected in the course of an artery feeding the growth. The danger of embolism does not appear to be great, but the precaution is advised of manual compression about the growth. Accidental scalding of the skin is avoided by anointing it with vaseline and covering the areas in the neighborhood of the injection with wet compresses. Care should be taken that the injection is not sufficiently superficial to cause sloughing, and that the needle is not thrust in so far that the hot water is thrown into the sound tissue at the opposite margin of the angioma. General narcosis is usually, not always,

*C. V. Mosby Co., St. Louis.

required; but the after-pain is fleeting. To minimize the edema produced, ice or cold compresses may be applied for a few hours.

It is important that the water should be injected at or near the boiling point. A needle of generous caliber is therefore essential. Reder likes best a glass syringe with an asbestos wound plunger, a shoulder on the barrel and a good-sized ring on the piston, with a slip joint for the needle. Horsley adheres to the all-metal syringe, which has the advantage that the water within it can be re-heated over a flame. Whichever is employed the fluid must be conveyed expeditiously from the vessel in which it is boiled to the tissues. Cotton or thick rubber gloves or gauze compresses are used to handle the uncomfortably hot instrument. The water is injected until the surrounding tissues become gray and tense, but not overdistended. Horsley plunges the needle into the most prominent part of the tumor. To avoid sloughing Reder, on the contrary, makes his first injections well beneath the neoplasm, entering the needle through sound skin at the margin of the growth, this procedure being to assure coagulation of the entering vessels. Area after area may be treated at a single sitting, but if the growth be quite large its complete destruction had best not be attempted at once. It is interesting to note that he normal tissue surrounding an angioma is not affected by boiling water injected into it, the blood vessels of the one not being continuous with the blood spaces of the other. The softening of the coagulated area is gradual and a few weeks should be allowed to elapse before re-injecting in the same neighborhood. In large growths the cure may thus take several months. It should be effected without surface scarring, which results, of course, if sloughing follows injudicious injections.—W. M. B.

# Surgical Suggestions

Don't treat a sciatica without a *thorough* physical examination. It is sometimes due to a carcinoma in the spine metastatic from an overlooked tumor of the breast.

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Don't operate upon a case of cancer before excluding, as far as possible, the existence of a metastasis. It would be distressing and embarrassing to learn soon after submitting a patient to radical breast amputation that the pains she had complained of in the extremities came from a metastasis in the vertebrae.

# Surgical Sociology

**Ira S. Wile, M. D., Department Editor.**

## SOME STATISTICAL PROBLEMS OF CANCER.

Among the numerous diseases still baffling medical science none presents more interesting problems than the almost ubiquitous cancer. It is a disease veiled in doubt and shrouded in mystery. Its etiology is unknown. Its medical treatment is apparently negligible. Its relation to industrial life is constantly a source of discussion. Research laboratories have been founded to pry into its secrets. Institutions have been provided for the maintenance and care of those willing to go thither to die. It attacks childhood and middle life but fortunately its direct results are in the late years of life.

There is much food for thought in noting that while the death rate per hundred thousand population for typhoid fever has decreased from 35.9 in 1900 to 17.9 in 1913, and tuberculosis has declined from 201.9 in 1900 to 147.6 in 1913, and diphtheria has dropped from 43.3 in 1900 to 8.8 in 1913, and dread pneumonia has fallen from 185.5 in 1900 to 132.4 in 1913, cancer has slowly risen from 63.0 in 1900 to 78.9 in 1913, along with organic heart disease which has risen from 123.1 in 1900 to 147.1 in 1913 and nephritis which has mounted from 89.0 in 1900 to 102.9 in 1913.

In the registration area during 1913 approximately fifty thousand persons died from carcinoma, with a death rate of 78.9 per hundred thousand population, comprising 5.6 per cent. of all the deaths in the registration area. The only diseases which carry off a larger proportion of the population are tuberculosis of the lungs, organic heart diseases, pneumonia, nephritis, congenital debility and violent deaths.

The median age at death was 60.4 in 1913. From the point of view of age, cancer is a less serious drawback to the development of society than is, for example, tuberculosis, with a median age at death of 32.2 or typhoid fever with a median age of 25.3. This fact is accentuated in the light of the median age at death from all causes for 1913 which was 42.2.

On the other hand, the increase in the occurrence of cancer apparently is manifest during all decades. During the 27 years from 1880 to 1907 there was a 90 per cent. increase in the death rate from cancer in persons over 60 years of age, but there was also a 46 per cent. increase from the death rate of cancer among persons between the ages of 20 and 30 years, and 10 per cent. increase for those below the age of 20 years. This illustrates, in a way, that there has been a general advance in the cancer death rate at each age period.

Among the various theories of cancer, there is still much discussion as to whether the disease is due to a microorganism, an embryonal inclusion, dietetic disabilities, either general or specific, or

hereditary influences. It is quite possible that in the groping after the truth there has been misinterpretation, owing to an attempt to account for the etiology on some particular theory forming part of the preconceived notion of the investigator.

It is socially of immense importance to discover whether cancer is dependent upon the ingestion of tea, coffee or alcohol or whether the figures relating to these are merely accidental in their association. It has long been felt that cancer was markedly influenced by occupation. The scrotal cancer of the chimney sweep has long been adduced as an indication of the production of cancer through sooty irritations. Workers in tar, pitch, paraffin and anilin apparently are more susceptible to epitheliomata than are other industrial workers.

How far traumatism constitutes a factor is still doubtful. In considering, for example, the percentage of death from cancer between the age of 55 and 64 years, the mortality of tailors from cancer is almost double the rate of death from tuberculosis, despite the sedentary and indoor occupation of tailors. Draymen, hackmen, teamsters, and iron and steel workers, during the same decade do not show any such high mortality rate from cancer as would be expected if trauma were a marked factor in the causation.

There appears to be no apparent causal relation between cancer life in cities or rural district, nor is there any special effect of varying climatic conditions within the country. A great problem is involved in the fact that negroes are less prone to suffer from cancer than whites. Herein is an opportunity for more careful, scientific research.

The general impression that cancer is increasing at all ages appears to be sustained by statistical studies. It is not merely a question of more accurate diagnosis and more careful registration, admitting, of course, that both of these have improved and have altered the character of statistical figures. The decrease in the number of deaths from tuberculosis has permitted more people to live to advanced age, but this does not account for the increased cancer mortality below the age of 30 years. Incidentally, early diagnosis would lead to more prompt surgical intervention. Despite this, the mortality of skin cancer has increased tremendously in the face of the ease in diagnosis of the lesions and the promptness with which surgical intervention may be secured. The mere prolongation of human life to the later decades does not account for the increase of the mortality of cancer in proportion to each 100,000 of the population. In other words, the absolute increase of mortality might be accounted for, but the actual ratio of increase per hundred thousand would still require explanation.

In the light of the widespread interest in cancer and the precancerous stage, with the campaigns of education that are being instituted for the purpose of making men and women realize the seriousness of cancer as a disease and the importance of early diagnosis and surgical treatment, one hesitates to see physicians lending themselves to statements tending to create false, misleading, or groundless hopes in the hearts of cancer sufferers or their families. There is an unusual responsibility upon the medical profession to give the medical truth to the public, but this truth must be the whole truth and not a half truth. There should not be paraded half-baked methods of treatment which up to the time of report have presented no satisfactory evidence of advance over caustic pastes, necrotising injections, or the results achieved by radium, the *x*-rays, methylene blue internally, or other therapeutic agents.

The treatment of inoperable cancer is still hidden by darkness while probably 80 per cent. of carcinomata reached the inoperable state, and it is therefore of the utmost importance to establish some mode of attacking the disease during this period. The greatest efforts must be spent in educating the public to giving prompt attention to their ailments during the curable stage. Surgery at the present may not deal in an etiologically sane manner with the problems of cancer, but it cannot be gainsaid that surgery, early and immediate, is at present the only practical solution of the cancer problem. Until the etiology of cancer is determined,—and only in this light may rational therapeutic measures be devised,—the stress of surgical opinion should be placed upon early diagnosis and early operation.

The victims of society suffering with cancer are not interested in Cohnheim's theory, after the disease is developed, nor does the ingestion of higher proteins appeal to them very strongly when there is the unhappy regurgitation from a gastric carcinoma. Society demands relief, cure when possible, and palliation as a last resort. The surgery of to-day is the social solution of the cancer problem. In its connotation, this means popular education, early diagnosis, adequate hospital facilities, prompt operation.

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## Food and Gastric Ulcer.

The observation of relief of gastric distress by food ingestion is of prime importance in diagnosis of uncomplicated peptic ulcer. If its history is constantly obtained, it is practically pathognomonic in three out of five cases. While patients, on casual questioning, frequently state that food distresses them, yet careful inquiry will elicit the fact that food does not at once cause discomfort, but that such comes on from one to four hours following ingestion. If the gastric lumen is not obstructed (hour-glass contraction) or if the pyloric channel remains patent, our observation is that the duration of food relief of pain bears direct proportion to the size and character of the meal taken. Small amounts of food give relief for a shorter period than do large, and liquid food relief is not infrequently more prompt than that obtained by solids. The dread of pain following food intake often leads to an anticipatory attitude on the part of the patient. —Frank Smithies, in *Interstate Medical Journal.*

# Book Reviews

**John Shaw Billings.** A Memoir. By FIELDING H. GARRISON, M.D. Octavo; 432 pages; illustrated. New York and London: G. P. PUTNAM'S SONS. The Knickerbocker Press, 1915.

The reading of this biography has afforded two dominant impressions. First, that John Shaw Billings was a greater man that we had known; and second, that he lived a fuller and more varied life than any other member of our profession that we recall. Few physicians, we venture to say, would associate Billings with anything more than the founding of the Catalogue of the Surgeon General's Public Library and the organization of the New York Public Library. These activities, however, are only a small part of Billings' achievements. He began his medical career as a demonstrator of anatomy. He then became an army surgeon and not only had much active surgical experience, but did much work in planning and organizing hospitals during the Civil War. He expanded the insignificant Surgeon General's Library into the greatest, if not the largest, medical library in the world. Moreover, he made the immense medical literature of the world once and for all available by planning the famous Catalogue—a unique and tremendously important achievement. Indeed, much of the early indexing he did himself with Dr. Fletcher. He conceived and started the monthly *Index Medicus*. These labors make him, in Dr. Garrison's words, probably the foremost medical bibliographer in the entire history of medicine. He was one of the pioneers in hygiene and sanitation, and throughout his life was one of the recognized authorities upon these subjects. He held, for a time, the chair of Hygiene in the University of Pennsylvania. He was unquestionably the foremost planner and organizer of hospitals in this country, and his work in connection with the foundation of the Johns Hopkins Hospital is one of his greatest achievements. He not only planned the building, but also conceived the splendid working scheme of this institution—a scheme that has profoundly influenced medical teaching in this country. Moreover, he selected many of the staff, to whom much of the success of this institution is due, showing that among other attributes, he was a keen judge of ability. He was one of the planners of the great Peter Bent Brigham Hospital, recently built in Boston. He was the first American physician invited to address the International Medical Congress. The last large work of Dr. Billings' career took him out of his chosen profession—the organization and direction of the New York Public Library, a man's job in itself.

These are only the more important of his labors. Throughout his life, like John Hunter, he was avid for medical study. He did much and important work upon the pathogenic parasites and bacteria. In his spare moments he dissected and studied botany. He was continually writing and making addresses upon the more diverse subjects—hygiene and sanitation, medical education, medical libraries and bibliography, vital statistics, craniology, biography and history, and public questions. The tabulation compiled by Dr. Garrison of 171 papers and books, indicates Billings' immense literary activity. His personality, sketched by the author in a separate chapter, is in accord with the bigness of his work.

Two attributes, especially, of this truly great American physician, impress the reader of this interesting biography. They are the fortitude and inconsideration of self with which he continued to plan and to execute even while suffering greatly from a painful malady for which he submitted to operations; and the prodigious energy he expended in conducting the laborious and painstaking tasks he assigned to himself. He not merely planned and directed, he himself labored vastly. When Congress, upon the urging of Jacobi and others, appropriated the money to supply the Surgeon General's Library with the back files of all the important foreign medical journals, Billings, the librarian, lacking much assistance, himself night after night, indexed and cross-indexed all the articles in these journals, *vanload after vanload!* Surely, a task that would have staggered all but such an exceptional giant of persistence and industry!

Dr. Fielding H. Garrison, the present editor of the *Index Medicus* and principal assistant librarian in the Surgeon General's Library, is, we think, Billings' successor as the leading American exponent of medical bibliography and history. His Introduction to the History of Medicine, as well as his bibliographic accomplishments, establishes him in this position. For this reason, and because of his familiarity with the subject, Garrison was peculiarly fitted to write this fascinating and affectionate tribute to his former chief. And yet he does not indulge in laudation. He sets forth, in his usual pleasing style, the story of Billings' life and accomplishments merely as a biographer; no praise was needed.

The reading of this book is a joy from cover to cover.

**The Treatment of Fractures,** With Notes upon a few Common Dislocations. By CHARLES LOCKE SCUDDER, M.D., Surgeon to the Massachusetts Hospital; Assistant in Surgery, Harvard Medical School, Boston. *Eighth Edition.* Octavo; 734 pages.; 1,057 illustrations. Philadelphia and London: W. B. SAUNDERS Co., 1915. $6.00, net.

The new edition of this very practical and deservedly popular work shows but few minor changes as compared with the seventh edition, published in 1911. So solidly is the book based on rational therapeutics and competent observation that few changes might, indeed, be looked for in the descriptions of fractures and their non-operative management. New material has been added to the consideration of fracture of the jaw and the acetabulum. A paragraph is now devoted to fracture of the greater tuberosity of the humerus—a frequent, often overlooked cause of shoulder disability that therefore deserves longer consideration. Several new illustrations have been added to the many admirable ones that have constituted so valuable a feature of this work.

In his preface Scudder says, "It appears to me that the greatest recent advance in the treatment of fractures of bone is the application of the principle of the autogenous bone-graft in cases of delayed union and non-union." We quite agree with him, and we were disappointed and surprised to find that the subject is not alluded to again in the text itself, "an autogenous bone graft" is added to the list of fixation agencies in the 9-page chapter on *operative treatment.* Otherwise this scant and unsatisfactory chapter is repeated as it appeared in the seventh edition. To be sure, the chapter is introduced chiefly as a plea for conservatism, but it is illustrated by pictures of bone plates, clamps and drills and it does give a list of fractures that most frequently offer rational indications for open treatment. Admitting that operative management has a definite and important place in the therapy of fractures, and recognizing the dignity of, and the wide interest in that phase of the subject this chapter should, we think, have been expanded into an adequate exposition of the various operative procedures, their technics, indications and contraindications. It would have been better, otherwise, to omit this chapter altogether which, by its brevity, serves only the purpose to emphasize the author's very proper attitude that most fractures may be well treated without the knife.

**Operative Gynecology.** By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Associate in Gynecology, Washington University Medical School and Associate Gynecologist, Barnes Hospital; Gynecologist, St. Luke's Hospital, St. Louis. Large octavo; 670 pages; 772 illustrations. St. Louis: C. V. MOSBY Co., 1915. $7.50.

In this handsome volume Crossen has made a welcome contribution to the various manuals and treatises on operative gynecology. It is an altogether excellent exposition of, and disquisition upon, gynecologic technics. All the useful and accepted operations are described in admirable detail, and each step is beautifully illustrated with original drawings by Ivan F. Summers. Of these illustrations of technic there are about 750, most of them halftones, and all of them of the highest order of excellence.

At first blush the critical might be inclined to complain that Crossen has described too many operations. A careful reading of his interesting text disposes of this criticism, for he takes pains to describe the character of each case that is best suited for one or another type of operation. Indeed, he takes the very proper stand that the time has passed for the attempt to develop "the best operation" for uterine prolapse, for retroposition, for relaxation of the vaginal walls. That such attempts have been and still are being made is well known. No one of the many excellent procedures devised is best for all cases, and it is one of the attractive features of Crossen's work that it teaches—as much as this can be taught didactically—the wise selection of operation for the lesion in hand.

We take pleasure in warmly recommending this attractive and useful book.

**Text-Book of Surgical Operations.** Illustrated by Clinical Observations, for Physicians and Students. By PROF. FEDOR KRAUSE, Directing Physician, Augusta Hospital, Berlin, in association with EMIL HEYMANN, M.D., Chief Physician, Augusta Hospital. Translated and edited by ALBERT EHRENFRIED, A. B., M.D., F.A.C.S., Assistant Visiting Surgeon, Boston City Hospital, etc. In six volumes. *Volume I.* Large octavo; 267 pages; 55 colored plates bearing 233 illustrations and 61 text figures. New York: REBMAN CO., 1915. $6.00.

Ehrenfried is doing a useful service in preparing an American edition of the distinctive Krause-Heymann system of operative surgery, expressive as it is of the clinical experience and surgical genius of Fedor Krause, and differing, as it does, from other works on operative surgery in that each procedure is illustrated by an individual case in the clinic, the description of which is followed to the end-result.

Without sacrificing anything of importance in the translation Ehrenfried has edited the work freely, adapting it, where necessary, to American practice, interpolating new case descriptions and other matter. He has maintained, however, the plan and spirit of the work—clinical demonstrations and discussions of operative surgery.

This, the first volume deals with general surgical technique (preparation, anesthesia, asepsis, after-treatment), and operations on the face, the orbit, the nose and accessory sinuses, the ear and mastoid, and the cranial nerves. The many and excellent original illustrations were drawn during the operations, in Krause's clinic, by Max Landsberg.

**The Origin and Nature of the Emotions.** Miscellaneous Papers. By GEORGE W. CRILE, Professor of Surgery, School of Medicine, Western Reserve University; Visting Surgeon to the Lakeside Hospital, Cleveland. Edited by AMY F. ROWLAND, B.S. Octavo; 240 pages; illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1915.

This volume consists of eight addresses, all, with the exception of the last, having a common theme. These addresses are the following: Phylogenetic Association in Relation to Certain Medical Problems; Phylogenetic Association in Relation to the Emotions; Pain, Laughter and Crying; The Relation Between the Physical State of the Brain Cells and Brain Functions—Experimental and Clinical; A Mechanistic View of Psychology; A Mechanistic Theory of Disease; The Kinetic System; Alkalescence, Acidity, Anesthesia—A Theory of Anesthesia.

It is impossible within a short review to summarize the many and ingenious hypothesis that Crile proposes. His main theme, briefly is this: "Injuries awaken those reflex actions which by natural selection have been developed for the purpose of self protection." This phylogenetic association expressed by fear is responsible for many diseased states, the most important of which are shock and exophthalmic goiter. Upon this principle of eliminating fear as far as possible, and the effect of fear upon brain cells, is based Crile's familiar hypothesis of anoci association. As some of the titles indicate, Crile is a strong mechanist.

Crile shows much ingenuity in the elaboration of his theses. In many instances his arguments are convincing, and in all, highly suggestive. While it is our impression that he often is carried away by the pressure of his ideas, we forgive him nevertheless, because he thinks we have at present too many observers and deductors in our profession. What we need are inductors of the kind that Crile so well exemplifies.

**Fewer and Better Babies or The Limitation of Offspring,** by the Prevention of Conception. By WILLIAM J. ROBINSON, M.D., Editor of *The Critic and Guide,* and of *The American Journal of Urology;* Author of "Never-Told Tales," "Practical Eugenics," etc. With an Introduction by A. JACOBI, M.D.,LL.D. Duodecimo; 245 pages. New York: THE CRITIC AND GUIDE CO., 1915. $1.00.

For the rational limitation of offspring, for the abrogation of laws that discourage the prevention of conception, Robinson has long and earnestly contended in his journal, *The Critic and Guide,* and in many other writings. In this interesting little book his arguments are set forth fearlessly and in his characteristically vigorous style. They are supported in an introduction by Jacobi. Two chapter headings and the safe and the unsafe means, respectively, of preventing conception are followed by blank pages—in unwilling obedience to, and as a protest against the censorship that would forbid the circulation of the book were these chapters included!

**Collected Papers of the Mayo Clinic,** Rochester, Minn. Edited by MRS. M. H. MELLISH. *Volume VI,* 1914. Octavo; 814 pages; 349 illustrations. Philadelphia and London: W. B. SAUNDERS CO., 1915. $7.00.

This is the eighth volume of the collected publications of the Mayo clinic, the sixth in annual sequence. It is arranged much as the preceding volumes, is as well illustrated, and as well edited. While these many interesting and, some of them, very important articles have appeared in various medical journals during the past year and are therefore elsewise available, it serves a useful purpose to bring them thus together. Volume by volume, these classified medical essays and reports, make attractive reading and are welcome, for reference, on the physician's book shelves. It is of passing interest to note that this year the words "St. Mary's Hospital" disappear from the title page and cover of the book.

## Books Received.

**A Text-Book of Radiology.** By EDWARD REGINALD MORTON, M.D., C.M. (Trin. Tor.), F. R., C. S. Ed., etc., Past President, Section of Electrotherapeutics, Royal Society of Medicine, in Charge of the *x*-Ray Department, West London Hospital, etc., etc. With 26 plates and 72 illustrations. New York: E. B. TREAT & COMPANY. 1915. Price, $3.00.

**Radiography, X-Ray Therapeutics and Radium Therapy.** By ROBERT KNOX, M.D. (Edn.), M. R. C. S. (Eng.), L. R. C. P. (Lond.), Hon. Radiographer, King's College Hospital, London, etc., etc., With 64 plates, 246 illustrations in the text and a frontispiece in color. New York: THE MACMILLAN COMPANY. 1915. Price, $8.00.

**Human Motives.** By JAMES JACKSON PUTNAM, M.D., Professor Emeritus, Diseases of the Nervous System, Harvard University. Duodecimo; 179 pages. Boston: LITTLE, BROWN & Co., 1915. $1.00.

**The Meaning of Dreams.** By ISADOR H. CORIAT, M.D., Instructor in Neurology, Tufts College Medical School. Duodecimo; 194 pages. Boston, LITTLE, BROWN & Co., 1915. $1.00.

# Progress in Surgery

**A Résumé of Recent Literature.**

**The Operative Treatment of Carcinoma of the Esophagus.** FRANZ TOREK, New York. *Annals of Surgery,* April, 1915.

Though surgical removal of carcinoma of the esophagus has been proved possible within the last two years, nevertheless, too few cases reach the surgeon early enough in the course of the disease where operation is feasible. Inability to swallow is, as a rule, the solitary symptom which brings the patient to the physician, and this is a late symptom. However, there are cases which are amenable to surgical removal of the involved œsophagus and for these cases, Torek holds, his method of operation promises best results.

He performs a preliminary gastrostomy; this permits feeding to improve the patient's condition—also at the time for gastrostomy the abdomen is thoroughly explored for metastases. Subsequently, preparations are made for attacking the esophagus neoplasm. The line of incision is outlined with silver nitrate—on the left side from the posterior end of the seventh intercostal space, between the angle and the tubercle of the rib, the incision is then carried upward to the third intercostal space. Torek uses one-half per cent. novocaine solution for this step. Anæsthesia is now maintained by intratracheal insufflation. The pleura is opened along the extent of the seventh intercostal space. If the condition is an operable one, the external incision is completed by dividing the seventh, sixth, fifth and fourth ribs between their angles and their tubercles, also the intervening intercostal muscles, vessels, and nerves. A rib spreader placed between the seventh and eighth ribs is pulled apart and the whole left pleural cavity exposed. The lung is thoroughly freed of adhesions, kept partially inflated and laid over toward the front part of the mediastinum. The pleura over the esophagus is divided and the esophagus lifted out of its bed; a tape is drawn through underneath it. The esophagus is liberated, divided so as to permit about 3 c. m. excess for invagination of the lower stump; the œsophagus is freed from the aorta by blunt dissection; when the upper thoracic aperture is reached a finger is carried into the neck and, under its guidance, an incision made through which the esophagus with the tumor is brought out. The chest wall is now closed, strong silk sutures are placed around the ribs to approximate them; catgut is used for the muscles. The lung is now inflated and the outer wound made air-tight.

The esophagus with the tumor portion from it is held down on the chest wall and an incision made at a point corresponding to the esophagus neoplasm is ablated. The skin is undermined, the esophagus drawn through. The tumor is removed, the neck incision closed, and the lower end of the esophagus sutured to the skin. A rubber tube connects the esophagus from this opening to the gastrostomy aperture. Food can, therefore, be swallowed, it passes through a portion of esophagus, then through the rubber tube and into the stomach.

This operation by Torek, successfully performed in one case by the author, is a rational attempt at radical removal of carcinoma of the esophagus.

**Observations on Myeloid Sarcoma, with an Analysis of 50 Cases.** M. J. STEWART, *Lancet,* November 28, 1914.

This is an excellent clinical and pathological review of the subject.

Myeloid sarcoma is locally malignant only and does not undergo dissemination. It is to be clearly distinguished, both clinically and pathologically, from malignant giant-cell sarcoma, in which death with visceral dissemination is the rule, even after the most radical operative treatment. The histological diagnosis is based on the morphological characters of the giant cells, especially as regards their nuclei. In myeloid sarcoma the latter are numerous, uniform, small and without mitoses; in malignant giant-cell sarcoma they are few, sometimes single, irregular, and often very large, while mitotic figures are frequent. The author advances a strong plea for the conservative treatment of myeloid sarcoma. He advocates thorough curettage as the operation of choice in the first instance in suitable cases; failing this, a local resection of the growth. Amputation should be the last resort, and only after the failure of less radical measures. An accurate histological investigation of the tumor is in all cases essential.

**Extension of the Limits of Operability of Recurrent Carcinoma of the Breast.** CARL BECK, Chicago. *Journal of the American Medical Association,* May 22, 1915.

Beck recommends a more extensive operation than has been used in cases of extensive recurrent and hopeless cancer of the breast. The only thing generally thought best to do is to apply Roentgen rays or Coley's fluid and morphin. In the course of the last few years he has been able to save a few such cases by the operation of exarticulation of the whole shoulder girdle, including the clavicle, arm and scapula, with the plexus and vessels of the infected side, and the ribs, should they seem invaded by the carcinoma. This method may have been used elsewhere, but the procedure is not common, and its publication may be of value. A definite plan cannot be prescribed in detail. The individual case must be considered. It is a delicate as well as an extensive operation, and attended with great shock to a person who is not often in the best condition. "On the whole, however, it begins with the formation of a large skin flap destined to cover the whole area of the defect, the exarticulation of the clavicle following, then dissection of the tissues of the neck and axilla in one block, ligation of every vessel as it is reached, cautious cutting on one nerve after the other, and lastly, the separation and excision of the scapula. Altogether, I have done this operation eight times in nine years. All cases were desperate; some of the patients operated on several times by myself or others, were all considered inoperable, some of them having consulted the best operators of the country, who declared surgical operations useless." The cases are reported, and two practical recoveries have been obtained, while another patient did well for three years before she was lost sight of. While the results are not ideal, they were good considering the desperate character of the cases, and the most important point of all seems to Beck to be the fact that there is some hope even in these most hopeless cases, when surgery is carried to its limit.

**The Treatment of Benign Papillomata of the Urinary Bladder with High Frequency Currents.** EDWIN BEER, New York. *Annals of Surgery,* June, 1915.

Although Beer has used this new method for destroying bladder tumors only since 1910, a wide experience enables him to state that this procedure is of decided value. It is of primary importance to ascertain if the vesical growth be benign or malignant; malignant neoplasms are not amenable to this type of treatment. The benign growths yield readily to the high frequency current. Where the diagnosis is in doubt at cystoscopy Beer insists upon the removal of a specimen of the tumor for microscopic study. A pathological report of malignancy excludes the cases from treatment with high frequency currents.

The Oudin or unipolar current is preferable to the d'Arsonval or bipolar current, since the former possesses the quality of explosive action which, in a great measure, prevents the attachment of the treated tumor by its more or less dead pedicle; moreover, the Oudin current has a more marked focal action at its point of application and a less marked distant action; it is also more perfectly controlled.

The author's conclusions are:

(1) Results with high frequency cauterizations have been satisfactory.

(2) Malignant tumors can usually be recognized by considering the evidence obtained at cystoscopy, the response to cauterization, from palpation, and from a microscopic study of excised and voided specimens.

(3) All malignant tumors should be excluded from this therapy.
(4) The Oudin current is preferable.
(5) The large size of a papillonea is no contra-indication to the use of this treatment.
(6) Inaccessibility, traumatic severe hemorrhages due to the introduction of the cystoscope, intolerance of the patient, and malignancy are the important contra-indications.
(7) The end results are very satisfactory. Beer's original cases are well over 4 years.

**Ovarian Fibroids; with Report of Six Cases.** ALFRED M. HELLMAN, New York. *Surgery, Gynecology and Obstetrics,* June, 1915.

The author concludes that the etiology of these rare tumors is still obscure and unsettled. The anatomical origin is variable. The symptoms are those of a tumor of the adnexa, and the diagnosis of fibroid of the ovary can be made only at the operating table. The treatment is operation. The prognosis is good. The tumors can best be classified as fibroma with and without ovarian rests. The pathology is variable from very small to very large. These tumors are, as a rule, hard and irregular, but may be cystic. They may undergo very many forms of degeneration, of which fatty degeneration is probably more common than usually noted. To call a given ovarian tumor a fibroma there must be a definite regularity of the individual fibrous or muscular cells and strands despite all other irregularities.

**Some Observations on Bone Transplantation.** DEAN LEWIS, Chicago. *Surgery, Gynecology and Obstetrics,* June, 1915.

Experimental and clinical work demonstrates that the compact bone in a bone graft is gradually absorbed, that it is replaced by new bone formed from the periosteum and endosteum of the graft. The periosteum of bone into which the graft is inserted also plays an important rôle and should be saved and brought into contact with the periosteum of the transplant or over its ends. The viability of bone grafts is especially well indicated by their reaction to infection, for involucrum and sequestrum formation occurs in infected grafts or in those placed in infected areas as it does in normal bone. Bone grafts placed in cavities, resulting from curettage of central giant-cell sarcomas or fibrous osteitis, will not survive in most cases, for the hematoma which occurs within the cavity prevents vascularization of the graft. The cavities can be closed most satisfactorily by a bone plug of some kind.

The inlay graft in the treatment of old ununited or recent fractures is more satisfactory than the intramedullary splint. Compact bone dies in the graft because of its physical properties, which do not permit of rapid permeation of serum. The best bone graft contains enough compact bone to give form and maintain fixation and also contains periosteum and endosteum from which the compact bone is substituted. Grafts taken from the anteromedial surface of the tibia are to be preferred to those taken from the crest.

**Misapplied Bone Surgery.** H. A. WILSON, Philadelphia. *New York Medical Journal,* April 17, 1915.

This is a strong polemic against the present "craze" to operate upon bones and joints. He believes that many of those newly devised operations, while ingenious and conceived in all sincerity, are unnecessary in the majority of instances, are attended with considerable risk, and frequently lead to a worse result than may be obtained by the older conservative methods. He concludes as follows:

1. Operations are rarely necessary in cases of fractures that have been treated on scientific principles from the onset.

2. Before operating for non-union, definite radiographic information should be obtained concerning the presence of callus, as well as that of bone atrophy involving the fractured bone or neighboring bones.

3. Bone transplants, or other operations for securing ankylosis, are not applicable to the early stages of bone tuberculosis, when functional recovery may be obtained with the control of the pathological process.

4. When it becomes apparent that the pathological process has proceeded to an extent beyond the possibility of functional restoration, ankylosis may be secured by either the brilliantly conceived Hibbs operation or that of Albee of broader application.

5. Ankylosing methods do not cure the bone tuberculosis, and therefore they must not be relied upon solely, but must be associated with prolonged fixation and other accepted methods of treatment.

6. Before resorting to any operation, except in an emergency, a consultation should be held, preferably with the attending internist.

7. When operative procedures are finally determined upon, the patient should be told the truth, the whole truth, and nothing but the truth, concerning his operation. If this information were reduced to writing and duly signed by those participating in the consultation, the total number of operations might be reduced, but the impressions that patients often appear to entertain in regard to the functional results obtainable would be removed.

**Simultaneous Fracture of Both Femurs.** ALBERT VANDER VEER and EDGAR A. VANDER VEER, New York. *Annals of Surgery,* June, 1915.

This case report is of interest in that within a few hours after the injury both limbs were promptly treated—the right comminuted bone plated, the left comminuted fracture treated by extension and plaster-of-Paris cast—and both types of treatment compared. After nine weeks the patient was out of bed. Skiagraphs then showed a decided bending of the left leg at the point of fracture and that the callus formation was not as perfect as in the right leg. Practically there was no difference in function between both limbs; the left femur was shortened about ¼ inch, measuring from the umbilicus.

**Empyema of the Thorax; A Critical Study of Eighty-two Cases of Chronic Empyema Sinus of the Chest, Treated at Mount Sinai Hospital, New York, in the Period of Ten Years, from 1903 to 1913.** ABRAHAM O. WILENSKY, New York. *Surgery, Gynecology and Obstetrics,* June, 1915.

In 75 per cent. of the patients the cause for the formation of the chronic sinus was present from the very inception of the disease. These can be grouped as follows: Fifty-two per cent. had uncollapsible cavities; seven per cent. had lung abscesses or bronchopulmonary fistulae, or both of these together; fifteen per cent. were tuberculous in origin.

Excluding the tuberculous cases, which present a special problem—that of the cure of tuberculous infection—60 per cent. of the patients owed their chronic sinuses to conditions which were present and were not remedied at the primary operation. The method of operating for acute empyema must permit of a thorough examination of conditions in the chest and the removal or correction of any lesion which tends to the formation of chronic sinuses. The remaining 25 per cent. of the patients owed their chronic sinuses to faults in the after-treatment, which with good care can and should be eliminated.

**The Operation of Rib Mobilization in the Treatment of Phthisis.** H. MORRISTON DAVIES, London. *British Journal of Surgery,* April, 1915.

Wilms first conceived the operation of rib mobilization for producing collapse of the lung in phthisis when a nitrogen pneumothorax was impossible because of pleural adhesions. This operation gave satisfactory results in the hands of Sauerbruch and the author, the latter found, however, that he could improve upon the operation so as to obtain a greater degree of chest mobility and subsequent collapse and also limit or avoid the usual post-operative shock and pain.

Morrison holds that it is essential to break the rigid arc at the lower path of the chest by dividing the costal margin. Collapse of the chest wall will be comparatively

slight unless this is carried out, however free the mobilization of all the upper ribs may be. He removes enough of the cartilage to leave a gap that shall not be less than ½ inch during the phase of respiration which is accompanied by the greatest degree of approximation.

After a week's preliminary stay in bed the patient is ready for the first stage of the operation. Chloroform in nominal amounts, with Crile's anoci-association anesthesia is the author's choice. The patient lies on the healthy side. Not more than m V of absolute alcohol is injected into the proximal part of the intercostal nerves in the zone of operation. This prevents post-operative pain, makes the field of operation anesthetic to a great extent at the second stage, and permits a good anesthesia to be obtained with a very small amount of chloroform. A vertical incision along the outer border of the erector spinae is carried upward into the neck above the first rib; the intercostal nerves are now injected C alcohol. Subperiosteally 6 c.m. of each rib is removed posteriorly. It is advisable to start at the fourth or fifth rib and then work upwards and downwards until eight or nine ribs have been resected. The divided muscles are united, the skin closed with no drainage.

Not sooner than two weeks after stage 1 may stage 2 be considered. Then the patient lies on his back. A vertical incision is made ¾ inch from the lateral sternal line extending from above the clavicle to below the costal margin. All the cartilages from the second downward and including the costal margin should be freed and then divided. Great care is needed in excising the first cartilage since it lies close to large vessels. As each cartilage is removed the corresponding part of the chest wall sinks in toward the mid-line; at the completion of this second stage, therefore, there is an immediate and marked collapse of involved thoracic wall.

After neither operation should dressings be changed until the skin sutures are removed. Tuberculin therapy is to be avoided directly before operation and for a long period after operation. Following promptly upon the second stage there is relief from cough and diminution in the amount of expectoration; the general condition shows definite and progressing improvement—the temperature drops to normal, the pulse slows, and the appetite improves. Even under unfavorable conditions, i. e., wasting, secondary infection, and bronchiectasis this two stage operation can produce a marked amelioration. Davies cites two such cases in point.

**Gastric and Duodenal Ulcer. The Influence of Operative Procedures on Gastric Motility and Secretion.** WALTER W. HAMBURGER and JAMES J. LEACH, Chicago. *Journal of the American Medical Association,* May 22, 1915.

This is a preliminary study of the post-operative results in a series of gastric and duodenal ulcers with special reference to the effect of operations on gastric motility and secretion, and the value of the procedure as gaged by these standards. After reviewing similar studies by Schüller, Dogaero and others, they give the results of their own studies, based on seventeen cases—nine gastric and eight duodenal ulcers—giving histories and details of the cases. The gastric ulcers are classed in two types: lesser curvature ulcers, four in number, and pyloric ulcers, and the case histories are given. The duodenal ulcers are discussed without protocols and the summary of their discussion is given as follows: "1. Operative procedures on stomachs with normal motility and secretion frequently produce stasis, hypersecretion or both. 2. Stasis may be caused by pylorospasm, by contents stranded below the level of the gastro-enterostomy opening or by contents held between the opening and the pylorus. 3. Hypersecretion may occur coincidentally or secondarily to stasis, but also independently, as a true post-operative hypersecretion, similar to the same conditions in dogs. This hypersecretory period is probably due to operative trauma, and is likely to be temporary. Post-operative hypersecretion explains certain discrepancies between bismuth and motor meal findings. 4. Operative procedures on stomachs with delayed motility and hypersecretion usually reduce motility to normal (but not beyond) and lower hyperacidity. This is particularly true if the pylorus is closed. If the pylorus is left patent, vicious circle, stasis in duodenum, spasm or secondary contracture of the opening are liable to continue the abnormal gastric function or to increase it. 5. Non-relief from surgical interference in gastric and duodenal ulcer is due to (a) lack of properly placed surgical indications; (b) lack of thorough and prolonged preoperative medical treatment; (c) failure to devise the proper surgical procedure to meet the individual case, and (d) lack of prolonged post-operative medical treatment."

**Radium Treatment for Scars.** (*Ueber die Radiumbehandlung von Karben.*) DR. KAMINER, Berlin. *Berliner Klinische Wochenschrift,* May 3, 1915.

Although the literature contains much on the radium therapy of Keloids, very little is said on the treatment of scars with radium. Kaminer has 49 soldiers under treatment. For the present he reports only 10 cases. These were cases of scar formation, causing deformities, marked limitations in normal function of the parts involved, and frequently pain. The exposures varied from 3 to 8 in number, the total time of radium exposure from 16 to 43 hours; about 25 mg. of radium were used. In all the cited cases improvement was marked. No ill effects were observed.

**The Early Diagnosis of Gas-Phlegmons by X-ray.** (*Die Frühzeitige Erkenung der Gasphlegmone durch das Röntgenbild.*) LUDWIG FINCKH, Konstauz. *Deutsche Medizinische Wochenschrift,* May 1, 1915.

In gas bacillus infections the severe malignant form offers little hope for saving an involved limb. The milder type of the disease, where an abscess forms about a foreign body with subsequent gas formation, although no surface signs point to the diagnosis of such a condition—here not infrequently early—*x*-ray may show a well defined zone of air formation and so lead to prompt measures for the recovery of limb and life. In a series of cases among the wounded in war, Finckh became convinced that radiography may be the earliest guide in the detection of gas formation in cases where, at the time of initial injury, the foreign body produced comparatively few symptoms and physical signs.

**A New Operation for Fistula in Ano.** S. J. BLUMENTHAL. *The Medical Record,* March 27, 1915.

After the anal opening is dilated the fistula is well curetted to remove granulations. A sound is introduced into the fistula to serve as a guide in placing a series of chronic gut sutures which encircle the sound. Each suture is placed ½ inch away from and always concentric with the sound. The very first suture should close off the fistula from the rectum; all the other sutures are left untied and the fistulous tract, which they encircle, is now Paquelinized—cauterizing a small portion at a time. A rectangular hard rubber plate is threaded on the sutures; this acts as a splint and compresses the entire tract when the sutures are tied. The advantages of this operation are (1) the anal splincter is not cut; (2) healing takes place under favorable clean conditions, there being no large, raw area; (3) the fistula is made sterile before collapsing it; (4) the operation is bloodless and leaves no scar.

**Congenital Defects of the Anus and Rectum.** EDWARD C. BRENNER. *Surgery, Gynecology and Obstetrics,* May, 1915.

The author has collected sixty-one cases. The cases fall roughly into two classes: (1) Imperforations with complete obstruction demanding immediate operative intervention; (2) Those with fistulous openings. In complete obstruction fecal drainage must be established and an outlet supplied that will imitate the natural anus in function and position. Perineal dissection for fistulous openings gives excellent results and is a safe procedure. Inguinal colostomy gives a high mortality and is to be used only as a last resort. Celiatomy combined with proctoplasty promises good results in selected cases. It must not be forgotten that congenital defectives of this kind often present multiple congenital defects, such as stenosis elsewhere in the gastro-intestinal tract, polycystic kidneys, etc.